EDITORIAL

Why They Like U. S. Cars

IN an article which we published last week, pointing out the ever-growing importance of New Zealand as a market for automobiles, reference was made to the fact that the great majority of cars in use there are of American manufacture. Why this should be the case is explained in an interesting manner by a New Zealand motor transport man, writing to the editor of an English automobile paper. Says the New Zealander:

"It is true that there are not a large number of English cars out here (comparatively speaking); the vast majority are American, such as Hudsons, Packards, Studebakers, Cadillacs, Dodges, Oaklands, etc., down to the universal Ford, and the reason for the successful American competition can be summed up in a few words, 'they give us what we want, high power with medium weight at a medium price.'

"We hold no unjust bias for Yankee goods, but we believe in giving credit where credit is due. We readily grant that some of the best cars in the world are made in England, but these high-grade, high-priced cars cannot be used in the Dominions for passenger transport as a payable business proposition, and no sane man would run his business at a loss for love of his mother country."

This should be encouraging to American manufacturers, some of whom recently have viewed with apprehension the fresh activity that British car builders are displaying in New Zealand in an effort to land a bigger percentage of the business.

50,000,000 in Ten Years?

AT the end of 1924 there were as many automobiles in use outside the United States as there were in the United States eight years previous, or at the end of 1916. In the last eight years registrations in the United States have increased more than 14,000,000. If anything like the same development in motor transportation takes place outside of this country in the next decade, the total number of automobiles operating throughout the world is likely to be over 45,000,000, and perhaps over 50,000,000.

This guess may seem wild at the moment, but guesses that there would be 18,000,000 motor vehicles in this country by 1926 were considered worse than wild ten years ago. However close the prediction of 50,000,000 may be, it is certain that foreign markets offer huge potentialities for car and truck makers. Up to the present time the American manufacturers have dominated strongly practically every automotive export market without any overwhelming effort. From now on more strenuous efforts may be needed to hold that position. Percy Owen, chief of the Automotive Division, Bureau of Foreign and Domestic Commerce, points out in a recent letter that the United States at present is not doing as great a proportion of the total foreign business as it was a few years ago, despite the fact that actual sales have increased enormously. British, French and Italian makers are getting into full swing again after recovering from the war. Their activities will increase every year from now on.

But the keener competition which results seems likely to benefit all concerned. The field is almost limitless. Competition is a strong educational force and will help to broaden the world market more quickly than would be the case if one nation dominated the entire field exclusively.

A number of companies already are exporting more than 10 per cent of their total output, while the export manager of one important concern told us recently that he fully expects to sell 20 per cent of his factory's product abroad within three years. The export market demands serious attention from every American factory.

Insurance and Financing

"WHY so much fuss about fire and theft insurance?" somebody asked the other day. "The cost of insurance of that kind isn't a very big percentage of the cost of the car, and the difference in insurance rates between various makes of cars isn't large enough to affect sales arguments much one way or the other. That being the case, I don't see why there is so much excitement about insurance."

The chief answer to that question is that insurance is closely allied with the entire question of financing retail sales. Under certain methods of operation, the cost of insurance—or what the public is charged—can run up into a considerable sum. The factories are eager to get their cars into the hands of the owners at the lowest possible cost. Since over 85 per cent of all cars are bought on time, the manufacturers must control the financing charges to a greater or less extent to achieve their aim. To control the financing charges, it becomes necessary to get into the question of insurance rates and the handling of insurance, because insurance is an integral part of every time sale. Rates alone are only a part of the controversy.

While the automobile business isn't going to go broke or rise to new heights of prosperity as a result of the outcome of the insurance controversy, the question is of sufficient importance to warrant the careful attention that it is being given at the present time.

Our Industry Today

Price Reductions Continue and Sales Are Stimulated Accordingly—August Prospects Excellent and Third Quarter Promises Gain Over 1924

NEW YORK, Aug. 13—Price reductions in passenger car lines are continuing. Only one or two important lines still remain unaffected by the general downward trend. The reductions have served the purpose of stimulating sales at a time of year when demand usually falls off materially. Following the best July in history, August sales and production are holding up well.

Earnings in the last half of the year are likely to be less than in the first half because of the price reduction, since there is no strong likelihood that production for the second half will exceed that of the first half by any very wide margin. Reasonably good profits seem assured, however, for some time ahead. The third quarter this year will be far ahead of the third quarter of 1924 unless all present signs fail.

Parts and accessory concerns are participating equally with the vehicle manufacturers in current prosperity. Parts plants in general are working well over 75 per cent of capacity, while some are pushing their facilities to the limit. A group of eight representative parts makers showed net profits for the first half of 1925 which were 89.5 per cent in excess of their earnings during the same period last year.

Production capacity in the passenger car field is being increased, although at a conservative rate in most cases. Production still is being held closely in line with sales and dealer stocks are normal in practically every part of the country.

Two more new models are being announced this week and several more are expected within the next fortnight. After that, announcement should fall off in number, although one or two rather important ones are expected around the first of September.

Favorable prospects for crops, especially wheat, make automotive executives particularly optimistic about fall and winter business. Farmer buying may be a large factor in determining automotive production for the last four months of the year. Consequently, agricultural conditions and prices are being watched carefully.

Buffalo Approves Buses

BUFFALO, N. Y., Aug. 12—The City Council unanimously approved a contract with Ernest M. Howe of the Gray Manufacturing Co., Detroit, under which he may operate a fleet of gas-electric buses here charging a fare of 5 cents. A certificate of convenience and necessity must be obtained from the Public Service Commission before the buses may be installed.

More Price Cutting Announced This Week

Willys-Knight, Jordan, Peerless and Overland Four All Reduce

CLEVELAND, Aug. 13—Announcement of further price reductions came this week from the Jordan Motor Car Co., Inc., and Peerless Motor Car Co., both of this city. In both instances the reductions were heavy.

Willys-Knight cars and Overland Fours followed with reduction announcements, and others are expected as the season advances.

The new Jordan prices are as follows:

	Old Price	New Price
Five-passenger touring car	$2,575	$2,275
Play Boy	2,575	2,275
Victoria	2,775	2,475
Brougham	2,875	2,575
Friendly Three	2,875	2,575
Five-passenger sedan	2,975	2,675
Seven-passenger sedan	3,325	2,975

Peerless Reductions

Price reductions on Peerless eights and sixes have been announced by Edward Ver Linden, president and general manager of the Peerless Motor Car Co. The prices f. o. b. factory are:

	Old Price	New Price
Four-passenger phaeton	$2,945	$2,845
Seven-passenger phaeton	2,990	2,895
Four-passenger Victoria	3,545	3,245
Five-passenger coupe	3,595	3,295
Five-passenger sedan	3,895	3,495
Seven-passenger sedan	3,995	3,595
Limousine	4,195	3,795
Peerless Six		
	Old Price	New Price
Five-passenger phaeton	$1,895	$1,895
Seven-passenger phaeton	1,995	.....
Sport roadster	2,285	2,195
Five-passenger coupe	2,495	2,295
Five-passenger sedan	2,565	2,395
Seven-passenger sedan	2,765	2,595
Limousine	2,925	2,695

Willys-Knight Prices

TOLEDO, OHIO, Aug. 10—Price reductions affecting the Willys-Knight four and six-cylinder lines, and the four-cylinder Overland 91 models were announced here today by Willys-Overland, Inc. The cuts on the Knight models range from $50 to $200 and on the Overland from $10 to $20. The new price schedules follow:

Willys-Knight Four	Old	New
Touring	$1,295	$1,195
Coupe	1,495	1,395
Sedan	1,575	1,450
Coupe-sedan	1,495	1,395
Brougham	1,695	1,595
Willys-Knight Six		
Roadster	$1,845	$1,750
Touring	1,845	1,750
Coupe-sedan	2,145	2,095
Brougham	2,295	2,095
Coupe	2,345	2,195
Sedan	2,495	2,295
Chassis	1,640	1,575
Overland Model 91		
Sedan De Luxe	$715	$695
Standard sedan	655	645
Coupe	635	625

Price Cuts Promise Keen Competition

DETROIT, Aug. 13—The question of why and how the various automobile manufacturers have been able to reduce the prices on their various models which have been recently introduced is causing no little agitation in this district.

While the manufacturers maintain the reduction has been due to the economies effected through quantity production and in saving of labor, others in close touch with the situation see a period of stiff competition at hand.

The prices of the various passenger cars on the market today give the buyer an opportunity to demonstrate his shopping ability and with such a selection available it means that the manufacturers who cannot compete with the present market must retire.

Certain of the manufacturers who reduced their prices did it with the knowledge that they were going after automobiles in their class or slightly under that have been doing phenomenal business this year. Their belief was that by reducing prices they would be able to get part of their competitor's business at no risk of losing their own.

WILL STUDY INSURANCE

PLAINFIELD, N. J., Aug. 13—Walter L. Hetfield, Jr., of Plainfield, former prosecutor of Union County, was named by Governor Silzer a member of the State commission to investigate and report to the next session of the Legislature upon the feasibility of compulsory automobile insurance. He will take the place of Senator Arthur Whitney.

YOUNG DECLINES TO HEAD AIR TRANSPORT

SCHENECTADY, Aug. 13—Owen D. Young of the General Electric Co., has declined to become head of the $50,000,000 corporation proposed by John Hays Hammond, Jr., Herbert Satterlee of New York and General Clarence B. Edwards, to establish daily air service linking the principal cities of America.

John Hays Hammond has proposed to President Coolidge that the Navy Department lease the Los Angeles during the experimental stage, for daily flights between New York and Chicago to be covered in twelve hours at a ten-cent mileage rate, or a total cost of $75.

"The dirigible routes proposed by us will not be in competition with the railroads," Mr. Hammond explained. "We have discussed the scheme with the heads of the leading railroads and they welcome the running of a daily air service between the chief cities of the United States. They say it will relieve them of some of the great expense of maintaining fast trains, which are not paying.

"If the Government cooperates to the extent of leasing the Los Angeles to us and manning it with naval officers for the experimental stages our company plans to build airships double the capacity of the Los Angeles and faster. Our plans call for ships of 5,000,000 cubic feet, capable of carrying 100 passengers with baggage and fifty tons of freight of a perishable nature."

Allison Co. to Construct Largest Airplane Motor

INDIANAPOLIS, Aug. 13—The Allison Engineering Co. of this city has been given the Government contract to construct the world's largest airplane motor which will be used as a power plant for the Barling bomber which now uses six Liberty motors. Details of the new power plant have not been given out, but it is known that it is an "X" type motor with four banks of six cylinders, two upright and two inverted. The new 24 cylinder job will be air-cooled and will develop 2400 hp. with a gasoline consumption of 120 gallons per hour. L. M. Langston, secretary of the Allison company, said that it will take six months to construct the huge engine which will supplant the six Liberties with great reduction in weight. Norman A. Gilman, chief engineer of the company, is in charge of this and other engineering and construction and the Allison concern is said to have a large number of orders for aviation engines and parts for the Government and other airplane builders. It is understood that the cost of the new Barling bomber motor is around $68,000.

Commercial Aviation History Written in Week of Progress

Ford Buys Stout Metal Airplane Co. as Financiers Propose to Launch Dirigible Service and Foreigners Prepare to Cross Atlantic

NEW YORK, Aug. 13.—New chapters were written in the United States this week in the history of commercial aviation.

Henry Ford bought the Stout Metal Airplane Co. outright, with the intention of linking the principal cities of the country on a regular schedule of delivery.

John Hays Hammond, Jr., proposing a $50,000,000 corporation with Owen D. Young, of the General Electric Co., as president, sought to lease the navy dirigible Los Angeles for a commercial line connecting American cities and eventually to go into the trans-Atlantic trade.

The Fokker Aircraft Corp. has arranged to take over the Atlantic Aircraft Corp., of Hasbrouck Heights, N. J., and will establish its plant in Kansas City to manufacture commercial planes.

In London, Joseph G. Navarro, noted aircraft designer, announced plans for a commercial trans-Atlantic air service using triplanes propelled by nine 450-horsepower motors.

The Douglas Co., of Santa Monica, Cal., announced a new machine designed to replace the De Haviland models in the postal service.

In France the famous pilots Landry and Brouhin set a new world's record for a non-stop airplane flight, having covered 2546 miles in 40½ hours, preparing for their proposed Paris-to-New York flight later this year.

Ford Buys Stout Metal Airplane Co. at Detroit

DETROIT, Aug. 12.—Henry Ford has bought out all stockholders and taken over the Stout Metal Airplane Co. at the Dearborn airport, together with its patents and manufacturing rights, and will operate the plant hereafter as a division of the Ford Motor Co. The transfers have been completed.

Although the price was not mentioned it is said to have been around $1,000,000.

It is announced that William B. Stout, founder of the Stout Co. and designer of the plane, manufactured in its plant, will be retained as engineer in charge of the Stout airplane division of the Ford Motor Co.

Stout will turn funds in hand into an independent operating company which will buy plane equipment from the Ford Motor Co. of the Stout metal design, and will organize and conduct aerial transport lines throughout the country. The new company is to be known as the Stout Aerial Transport Co. It will conduct lines for companies formed and carry mails, express and freight at so much per pound, taking all responsibility for successful operation.

"The Ford Motor Co. plans to connect the various large cities in the United States by airways and maintain a regular schedule of deliveries," said Mr. Ford. "These cities will include New York, Buffalo, Minneapolis, Chicago, St. Louis, Cleveland, Indianapolis and others."

These planes will vastly cut down delivery time on important parts for all cars and tractors, and will haul a large percentage of the interplant mail.

TO TEST FLYING BOAT

LONDON, Aug. 6 (By Mail)—Sir Samuel Hoare, Secretary of State for Air, will fly over the North Sea in the first test of one of the secret "flying boats" recently completed for the British Government. The machine chosen is a two-engine Southampton, fitted with two Napier engines, one on each side of the boat.

EXHIBIT OLDEST BUS

DETROIT, Aug. 12.—"Old Number Nine Mack" said to be the oldest motor-bus in the United States attracted the attention of a large number of Detroiters recently when it was on exhibition at the Mack International Motor Truck Corp. It is now on a tour of the country.

Fokker to Establish Big Factory in Kansas City

KANSAS CITY, MO., Aug. 13—The Fokker Aircraft Corp. will establish its principal offices and factory in Kansas City, Mo., some time in January, 1926. The Atlantic Aircraft Corp. plant at Hasbrouck Heights, N. J., will soon become a subsidiary of the Kansas City corporation. The New Jersey plant is now being operated by Anthony H. G. Fokker, with Frank R. Ford, George H. Davis and Lorillard Spencer under the patents and supervision of Mr. Fokker. Mr. Fokker's present associates will also be interested in the syndicate formed here for the establishment in Kansas

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Joseph J. Cole Is Dead at 56 Years

Veteran Indianapolis Manufacturer Is Victim of Heart Stroke at Home

INDIANAPOLIS, Aug. 12—Stricken with a heart attack last Wednesday, Joseph J. Cole, president of the Cole Motor Car Co., died at his home in this city Friday night. Mr. Cole had been in uncertain health for two years, but until last week his condition was never considered critical.

The veteran automobile manufacturer had planned a two-year tour circling the globe with his wife, which was to have been started in July, but was postponed on account of the death of Mrs. Cole's mother.

In 1904 Mr. Cole founded the Cole Carriage Co. and four years later he built the first motor car of this make. The name of the concern was changed to the Cole Motor Car Co. with the founder as president. He retained this position and held controlling stock in the company.

Mr. Cole never participated in any other business than that of his own company, devoting to it all of his time and boundless energy. The Cole company reached its peak of fame in the industry in 1921 when it maintained approximately 1,000 dealer connections. It was never in very large production, however, and Mr. Cole was a believer in a small scale business with close personal supervision. The measure of his success is in the comfortable fortune he is known to have accumulated.

Was Carriage Builder

As Mr. Cole's physical condition weakened in late years the company gradually reduced production. Samuel J. Kukua has been vice-president and J. Frank Morrison, secretary-treasurer, for many years.

Mr. Cole is survived by the widow, one son, Joseph J. Cole, Jr., who is in the sales division of the company, and a sister, Mrs. E. D. Filby, of this city.

For thirty-five years prior to his entry into the automobile industry, Mr. Cole was a leading figure in the carriage business. He was born in Connersville, Ind., in March, 1869, and when a young man he came to Indianapolis to enter the old Parry Manufacturing Co., makers of carriages and road carts.

Later he was associated with the Moon Carriage Co. of St. Louis as sales manager, becoming secretary of the concern before he resigned to establish the Cole Carriage Co.

The study of vehicles became a trait of the manufacturer in early boyhood. He was born on a farm owned by his father, Joseph J. Cole, in Fayette county near Connersville. He went to school in Connersville and attended business college in Richmond, then worked in a hardware store at Rushville when he was 17, where he spent many a sultry, summer afternoon repairing the carriage, or the farm wagon of some neighbor.

Joseph J. Cole

He acquired his first actual office experience with the Parry Manufacturing Co., working in the executive offices, where his practical knowledge of the work became a valuable asset. He was sent out on the road and covered the whole United States as he sold carriages and road carts to fashionable city sportsmen and drawling men of the back country. When he had finished with this, the young man had a knowledge of human nature as well as of carriages.

His affability and human understanding were characteristics which endeared him to friends and associates through his whole lifetime. Mr. Cole was a member of the Columbus Club, Chamber of Commerce, Board of Trade, Highland Golf Club, Indianapolis Athletic Club, Hoosier Athletic Club, Society of Automotive Engineers and the National Manufacturers Association of America.

Austria's Heavy Tariff Hits American Cars

VIENNA, Aug. 6 (*by mail*)—Importers of American automobiles in Austria soon will be obliged to suspend unless steps are taken to lower the discriminative tariff against American cars, in the opinion of G. F. Bauer, Secretary of the United States National Automobile Chamber of Commerce, who came to Vienna to investigate the situation.

While French cars are rated at about 40 per cent on the wholesale value, American cars now pay 80 per cent, and in some cases 100 per cent.

Not content with limiting the yearly import of American cars to 300, the Government has brought out a new table of values.

Welding Society to Convene in October

"Spot Welding of Automobile Bodies" One of Important Subjects on Program

BOSTON, Aug. 13—Plans are practically completed to make the fall meeting of the American Welding Society the largest and most successful ever held. Three days, Oct. 21, 22 and 23 will be devoted to the various technical sessions, demonstrations, exhibits and entertainment. The headquarters for the meeting will be at the Massachusetts Institute of Technology, Cambridge.

Exhibits of welding, welded products and actual demonstrations of welding and cutting are to be featured at this meeting. Twenty thousand people, including some of the leading industrial executives of the northeastern part of the United States, are expected to be present.

Five technical sessions are scheduled on important subjects, among which one of the most important will be that of Friday afternoon, when J. W. Meadowcroft, of the E. J. Budd Manufacturing Co., will read a paper on "Spot Welding of Automobile Bodies."

The program will be as follows:

Exhibitions and Demonstrations.—Wednesday, Thursday and Friday 9 a. m. to 5 p. m. and Wednesday evening, 7.30 p. m.

Technical Sessions.—Wednesday morning, Oct, 21, 10 a. m. to 12 m., "Thermit Welding," J. H. Deppeler, chief engineer, Metal and Thermit Corporation.

Wednesday afternoon, Oct. 21, 2 p. m. to 4 p. m., "Gas Welding of Power Plant Piping." Author to be announced later.

Thursday morning, Oct. 22, 10 a. m. to 12 m., "Industrial Application of Arc Welding and Economies Effected Through Its Use." Joint Paper by H. M. Hobart, chairman, Electric Arc Welding Committee, and W. Spraragen, secretary.

Friday morning, Oct. 23, 10 a. m. to 12 m., "Selection of Materials for Welding." A series of short addresses by several authors.

Friday afternoon, Oct. 23, 2 p. m. to 4 p. m., "Spot Welding of Automobile Bodies." J. W. Meadowcroft, General Supervisor of Welding, E. J. Budd Manufacturing Co.

Research and Business Session.—A meeting of the research department of the Society (American Bureau of Welding), will be held Thursday afternoon, Oct. 22, 2 p. m. to 4 p. m. Program will include review of present activities and outline of future investigations.

A Board of Directors' meeting will be held following the research meeting at 4 p. m.

EDSEL FORD IN BOAT RACE

DETROIT, Aug. 12—Edsel Ford has nominated his Woodfish for competition in the Harmsworth international championship speedboat regatta to be staged on the Detroit River in September. The rebuilt craft is equipped with a Ford aviation twelve-cylinder Liberty engine.

Aviation History Written This Week

Commercial Flying Gains Impetus as Forward Steps Are Taken

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City of American headquarters for the Fokker projects.

The company plans to produce 1000 planes per year and will foster development of commercial and postal aviation, no opportunity being lost to establish terminals and routes in Kansas City and its trade territory. About $400,000 has been set aside for the building and equipment of the Kansas City unit.

The trustees for the new organization are Mr. Fokker, Joseph F. Porter, president of the New England National Bank and Trust Company and the Kansas City Power and Light Company, and Frank R. Ford, New York business man and manufacturer. Mr. Fokker will be granted an option for five years to buy 5300 shares of common stock at $200 per share.

New Douglas Mail Plane Reported to Be Superior

LOS ANGELES, Aug. 12—Coincident with the visit to its plant of Secretary of the Navy Wilbur, the Douglas Co. of Santa Monica announced the completion of the first Douglas mail plane, which is declared to embrace many revolutionary features of great interest to the airplane industry.

The new flyer is an adaptation of the Type XO observation plane built for the United States Army and adopted as the standard all-serving plane for the Air Service to replace the De Haviland, which has served since the early days of the late war. Just as the XO replaces the De Haviland in the army, the new Douglas mail plane is designed to replace the De Haviland mail planes, which have been standard in the Air Mail Service.

Where the De Haviland mail plane carries only 200 pounds of mail over the high peaks of the Sierras the Douglas will carry 1000 pounds. The De Haviland with this load of 200 pounds can climb 15,000 feet in twenty minutes. In the same length of time the Douglas plane carries 1000 pounds to a height of 17,500 feet. The De Haviland makes a high speed of 120 miles an hour and the Douglas plane 145 miles.

IN AIR 40½ HOURS

ETAMPES, FRANCE, Aug. 8—The French aviators Drouhin and Landry became holders of the world's record for a non-stop airplane flight, having covered a distance of 4100 kilometers (2546 miles).

They had been aloft 40½ hours. The aviators were still in the air and had fuel to keep them going seven hours longer. They are testing for a proposed flight later this year from Paris to New York.

AIRPLANE FUEL FROM APPLES AND POTATOES

SPOKANE, WASH., Aug. 12—Lieut. Nick Mamer, 116th Observation Squadron, National Guard, and a Government forest patrol flyer, recently flew a biplane from Spokane to Wallace, Idaho, a distance of 90 miles, in one hour, using an alcohol-base fuel made from cull apples and potatoes. A factory has started production of this fuel here, known as Vegeline.

Plans Trans-Atlantic Passenger Air Service

LONDON, Aug. 8 (*By Mail*)—A commercial trans-Atlantic air service, using triplanes propelled by nine 450 horsepower engines, was tentatively announced here by Joseph G. Navarro, well-known aircraft designer.

The planes have a span of 185 feet. One of the nine 450 horsepower Napier Lion engines will be placed in the nose of the machine. The other eight will be fitted, four on each side in tandem, one of each pair to act as a tractor, the other as a pusher.

Needs Twelve Engineers

With each pair of engines there will be an engine room, with quarters for an engineer in charge. Mr. Navarro's idea is to have twelve engineers on each plane, who will relieve each other at eight-hour intervals. A crew of thirty-eight men will handle each plane.

The planes will have a dining room, electric kitchen and sleeping cabins. Stewards and stewardesses will be carried on all trips. There will be capacity for 150 passengers and fares to New York will be as low as $275.

The cost of each machine is estimated by Mr. Navarro at about $750,000.

The time for the journey is placed at thirty-five hours.

Naval Planes Will Fly to Hawaii Aug. 28

WASHINGTON, Aug. 12—Indications now are that the proposed naval flight from the California coast to the Hawaiian Islands will start Aug. 28. Captain Stanford E. Moses, who is in command of the flight, notified the Navy Department that he has arranged a schedule calling for the start to be made that date, weather conditions permitting.

"Every effort has been made to obtain expeditious shipment of outstanding material," Captain Moses reported. "Preliminary training is progressing satisfactorily with the cooperation of the destroyers and aircraft."

Employment Report Indicates Prosperity

Automotive Industry Generally Continues Steady Rate of Production

WASHINGTON, Aug. 13—Highly satisfactory employment conditions in the automobile industry during July are generally reported by the U. S. Employment Service of the Department of Labor in its August industrial bulletin covering the principal automotive centers and just made public here. The high lights of the survey follow:

Michigan, general: Automobile factories are operating overtime in a great many departments, and highly skilled automobile mechanics are scarce.

Detroit, Mich.: At Highland Park there is a surplus of automobile workers.

Flint, Mich.: One of the large automobile plants has been increasing production daily and there is a shortage of die makers for automobile-factory work apparent. Some departments in automobile plants are operating overtime.

Indiana, general: Automobile and automobile accessory plants are operating on schedules considerably higher than a year ago.

Pennsylvania, general: Due to taking of inventories, the automotive industries which are on part time, have slowed down in operations.

New York, general: A number of automobile industries, body building, and accessory plants are keeping up a high rate of production and employment in these lines continues satisfactory; however, in some automobile plants a recession in operating schedules is reported.

Buffalo industrial district: The automobile industry is still operating at a good pace. The rubber industry is very active, and employment in this line continues satisfactory.

Yonkers industrial district, New York: Automobile plants at Tarrytown are operating at a fairly high rate for this season of the year, with labor well employed.

Jamestown industrial district, New York: Plants manufacturing auto accessories, metal doors and trim are still working overtime and taking on additional help.

Wisconsin, general: Increased employment was reported in the automobile and allied lines.

SELL OLD WAGON PLANT

TOLEDO, Aug. 13.—The plant of the Milburn Wagon Co. here has been sold by the Buick division of the General Motors Corp. to the Toledo Edison Co. for use as a service headquarters. The large four story brick plant has been idle for two years. Although consideration was not announced it is thought to be in excess of $300,000. Part of the plant was sold to the Grob Plating Co. a year ago.

Sales Continue to Promote Prosperity

Peerless Shows July Gain of 154 Per Cent—Others in Accord

NEW YORK, Aug. 13—Financial reports and sales continue to indicate a condition of assured prosperity in the automobile industry. Those announced during the week were as follows:

Peerless Sales Advance

CLEVELAND, Aug. 13—Since February Peerless Motor Car Co. reports a steady growth, month by month, and the increase in Peerless sales this year, as compared with last year, has been running many times higher than the increased production of the industry as a whole.

"While retail trade, as a whole, has been running 13 per cent above last year during the last month, Peerless sales have been practically double what they were a year ago," said Charles A. Tucker, sales manager. "Not only has there been a big increase at the principal distributing points, but there also has been a marked interest in the Peerless franchise, more than ninety new distributors and dealers having been added during the last five months.

"June sales of Peerless cars—the Equipoised Eight and the Peerless Six—were 75 per cent higher than during the same month a year ago. In July the growth was even more significant, sales for the month being 154 per cent greater than in July, 1924. And orders already on hand for August indicate that Peerless will continue to operate at a far greater increase over the preceding year than the industry as a whole. This Peerless record is, of course, most satisfactory."

Predicts All-Year Trade

BUFFALO, Aug. 13—Having returned from a 9000-mile trip, taken for the purpose of studying conditions in the automobile industry in all sections of the United States, L. E. Corcoran, general sales manager for the Pierce-Arrow Co., says he found much to indicate that the unhealthy condition of peak buying in the spring and fall, followed trade stagnation in midwinter and midsummer is dying out.

Business has continued at a high level through the summer, he says. Buyers are coming to the conclusion that it is just as sensible to buy in one month as it is in another, regardless of the season. "The habit of buying in the spring," he said, "was a heritage of the early days when there was but little winter motoring. That has been changed by the all-season closed cars at prices close to those of the open models. The fall buying was the result of the uneconomical

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MOTOR STOCKS

Irregularity Marks Price Fluctuations with Little Change Anywhere

NEW YORK, Aug. 13—The same irregularity which has marked price fluctuations in the stock market sessions of recent weeks characterized the markets of the past week. Without any change in the fundamentals of business or finance individual issues have advanced sharply in some cases and declined sharply in others. Manifestly such fluctuations give no cue to the future but rather represent either informed buying on the one hand or the whims of professional speculators on the other. Money rates have continued firm as the banks prepare for the demands which will come with the seasonal movement of the crops.

The outstanding development of the week was the series of price reductions announced by various motor car manufacturers. These varied from $50 by the Chevrolet Co. to $405 by the Studebaker Corp. Wall Street accepted the reductions as indicative of a need to sell cars, but curiously enough bankers emphasized that the reductions are not so much an indication of an actual need for stimulating demand as an effort to increase the field for a given class or classes of buyers. Within the past week the writer has visited several of the automobile manufacturing centers and has talked with bankers in each city. These gentlemen uniformly expressed the opinion that not only will gross sales continue 25 per cent above those of last year, but that net earnings for the remainder of the year by most of the larger companies will show substantial gains over a year ago.

There are one or two cases where some question is expressed as to the final outcome at the end of the year, and in these cases the action of the stocks themselves has indicated that considerable doubt as to their future status existed in the minds of those responsible for their market. The substantial rise in Fisher Body naturally has attracted a large volume of profit taking with a resultant halt in the advance. Usually well informed sources continue to express the opinion that a large extra cash dividend will be declared by this company in order to reduce a cash asset position before absorption by General Motors. There are not lacking those who see in the latter stock the possibility for as large an advance as has occurred in some other issues sponsored by the same banking route. The earning and assets position of this corporation, together with the basic changes occurring in the industry, seem to justify an optimistic opinion in the future of the securities of this corporation.—H. H. S.

Europe Letting Down Bars to Car Imports

George F. Bauer Finds Prospects for American Sales Abroad Much Better

NEW YORK, Aug. 12—Legislative bars to American automobile sales in Europe are being lowered in several important instances, said George F. Bauer, secretary of the foreign trade committee of the National Automobile Chamber of Commerce, on his return from a three months' trip to the continent.

Germany is preparing to replace the present license system, permitting the entry of only four American cars of each make a month, with a tariff arrangement under which sales in considerable volume may be expected, Mr. Bauer reported. Early action on this program is looked for, and Austria may follow the lead of Germany. Mr. Bauer found that the lowering of the Finland tariff, which discriminated against American imports, has greatly stimulated sales there.

"Customs restrictions and lack of financing facilities are the principal restraining factors in the foreign field today," said Mr. Bauer. "The people for the most part want automobiles and will buy them if prices and terms are right. Progress is being made toward admitting American cars on a basis that permits fair competition, but a great deal still remains to be done along these lines, and in the way of extending credit.

No Credit is Available

"In Germany, for instance, interest rates are 10 to 12 per cent, and there is no credit available for financing dealers or retail sales. As soon as the European nations lay aside their petty jealousies and establish themselves on a basis that will inspire the confidence of investors, capital should be made available for automotive transactions.

"Only in Sweden and Denmark did there seem plenty of money for financing sales, and the terms, it must be said, were hardly sound. In many instances only 10 per cent cash was required and the balance spread over two or three years.

"In most of the continental countries I was able to make arrangements with dealers' associations and automobile clubs for educational programs to awaken the governments and peoples to the need for economical transportation and with it good roads and effective traffic control."

$1,100 FOR FORD CAR

BERLIN, Aug. 12—The duty on a Ford automobile imported into Germany will be about $500 under the new tariff act which was passed without amendment by the Reichstag today. The car will sell in Germany for $1,100, but even at this price American manufacturers expect a considerable sale.

Sales and Finance Reports Hopeful

Pierce-Arrow, Apperson and Others Record Unusual Business Gains

(*Continued from page* 272)

practice of some makers in bringing out new models in midsummer. The more stable manufacturers have pursued the policy some years of continuously making improvements and refinements without announcing yearly models."

Apperson Sales Gain

KOKOMO, IND., Aug. 12—Celebrating the first anniversary of the factory reorganization of last July, the Apperson Automobile Co. established a second record breaking sales mark in successive months with the close of July business.

Previously the June, 1925, sales had exceeded all totals for any month of the year and topped any summer month in the history of the old Apperson Brothers Automobile Co.

Sales for July, however, were greater than June and 225 per cent above the mark of January, the month in which the new Apperson line was introduced. The mounting sales curve of this now strongly entrenched manufacturing company is graphically shown by the fact that while each month of the year showed healthy advances, June's increase was 219 per cent over the January figure and July went 225 per cent over.

Auburn Shipments Heavy

TOLEDO, Aug. 13—E. L. Cord, vice-president and general manager of the Auburn Automobile Co., in a statement just issued says 1925 is the greatest year in the history of the company.

"The enthusiastic reception accorded the new Auburn models by dealers and the motoring public at their introduction last winter led us to predict a great sales record for Auburn this year. But our actual sales have exceeded even our greatest expectations," continues Mr. Cord.

"Many departments of the factory have been forced to work two shifts for months and still production has been unable to keep pace with orders.

"In spite of the fact that we were unable to get into production on our complete line of six and eight cylinder models until late in the season, by special production efforts we have been able to ship more cars during the first six months of this year by a comfortable margin than we did all last year. Orders now on file justify continued high production during the coming months.

IN AUTOMOTIVE INDUSTRY

SPRINGFIELD, MASS., Aug. 12.—The National Equipment Co. has entered the automotive field by taking on the rights to manufacture and sell the Kobert Electric Forging and Riveting machine, which had been built previously on a small scale at Worcester.

BRADY SAYS CHRYSLER GAINS SALES ABROAD

Nicholas F. Brady, director of the Chrysler Co., who has just returned from a visit to Europe, said that sales there of the Chrysler Co. are about 400 per cent ahead of last year. "The Chrysler," he said, "is seen more often in Europe than any other American car. Our London agency is clamoring for sixes and fours. Many English motor car owners who have Rolls-Royces are buying Chryslers, too. I believe the remainder of the year will be just as good for the motor industry as other months have been. I cannot see any slackness anywhere."

Ford Sales Advance

DETROIT, Aug. 12—Record business in every department was done by the Ford Motor Co. in July. Domestic sales of Ford passenger cars and trucks were 167,626, or 6182 more than July in 1924.

Fordson tractor sales were 3300 more than the previous July, and 207 more Lincoln cars were sold.

The August outlook is reported to be even better than July, with reports from branch dealers indicating larger sales than usual. Increased buying of Fordson tractors in agricultural sections was especially noticeable in July.

U. S. Rubber Increases

AKRON, Aug. 12—United States Rubber Co. sales for the six months ended June 30, 1925, amounted to $92,530,127, an increase of $14,755,431, or 18.97 per cent over the corresponding period of last year. This increase resulted principally from a substantial increase in unit sales of tires, the average selling prices being materially lower than for the corresponding period in 1924, notwithstanding the fact that prices were advanced in May, and again in June, 1925. Sales of other products were satisfactory, especially mechanical goods, which showed a substantial increase.

Net income amounted to $8,860,674 before interest on the funded indebtedness but after all other charges, including depreciation of plants; interest on the funded indebtedness amounted to $2,985,470, leaving net income of $5,875,204. This compares with $4,422,487 for the first six months of 1924, an increase of $1,452,717, or 32.85 per cent.

As of June 30, 1925, current assets amounted to $124,073,421, consisting of: cash $9,582,328; accounts receivable, less adequate reserves for doubtful accounts, $47,514,333; inventories of finished goods and raw materials, at cost, which was materially below replacement value, $66,976,760.

Current liabilities amounted to $17,751,028, consisting of current accounts payable, acceptances for importation of crude rubber, and accrued liabilities. There were no bank loans.

As yet, no part of the profits of the plantation companies has been included in the income of the United States Rubber Co.

Peerless Truck Reports

CLEVELAND, Aug. 12—Peerless Truck & Motor Corp. and subsidiaries report for quarter ended June 30, 1925, net profit of $327,234, equivalent to $1.43 a share (par $50) earned on outstanding 228,589 shares of common stock, compared with net loss of $280,514 in preceding quarter.

Net profit for first half of 1925 was $46,719 equal to 20 cents a share.

Consolidated balance sheet of Peerless Truck & Motor Corp. and subsidiaries, as of June 30, 1925, follows:

Assets: Cash $996,715; notes, accounts receivable, etc., $622,081; inventories $3,465,406; sundry securities owned, $3,682; land, buildings, machinery, etc., less depreciation, $5,068,213; patents, franchises and good will $1; deferred charges, $39,642; total, $10,195,740.

Liabilities: Accounts payable, $1,125,066; accrued taxes, insurance, etc., $167,367; reserves, $154,368; common stock (represented by 228,589 shares, par $50) $6,327,560; surplus, $2,421,379; total, $10,195,740.

Spicer Co. Profits Up

NEW YORK, Aug. 12—The Spicer Manufacturing Co. for the half-year ended June 30 reports gross profits of $1,206,256 after depreciation reserves, against $1,139,219 reported in the same period last year. After allowing for all expenses, interest and other deductions, and crediting other income, the company reported net profit of $966,169 for the half year, before Federal tax reserves, against $703,644 in the same period in 1924.

Moto-Meter Sales

NEW YORK, Aug. 12—Moto-Meter Co., Inc., reports its sales of Boyce Motometers in July were 35½ per cent ahead of July, 1924, and 23½ per cent ahead of July, 1923, setting a new record for July sales.

Murray Body Reports

NEW YORK, Aug. 12—Murray Body Corp. shows net income of $499,726 before taxes for the first half of the previous year, equal, after allowing for dividend requirements on the 8 per cent preferred, to $1.70 a share on 234,573 no par common stock. Gross profits were $1,101,608 and expenses $344,989.

Federal Motor Truck Company

NEW YORK, Aug. 12—Federal Motor Truck Co. reports net profits before taxes in the first six months of 1925 were $754,000, against $351,000 for the first half of the previous year. Estimating Federal taxes at $94,250, there would remain $695,750 available for 200,000 common shares, or $3.30 a share against $1.53 a year ago. The company shipped 3741 trucks in the half year as compared with 1880 for the same period last year. July shipments last month were 504, against 358 in July, 1924.

Harvester Co. Buys Moline Tractor Shop

International Will Use Huge Plant Temporarily for Storage Purposes

MOLINE, ILL., Aug. 13—Following negotiations lasting several months, the great tractor plant of the Moline plow Co. has been purchased by the International Harvester Co., Robert W. Lea, president of the Moline Implement Co., and General Hugh S. Johnson, president of the Moline Plow Co. and chairman of the board of directors of the former company, closed the deal at a conference in Chicago with Alexander Legge, president and general manager of the purchasing company.

The price was not disclosed. The buildings included in the sale have a floor space of 425,000 square feet. The International company proposes to use the plant here as a storage unit for the present. Mixed car load lots of tractors, binders, and other tillage implements manufactured by the Harvester company will be reshipped from here into the South and Southwest, as orders are received.

The nature of the plant, all its floor space being located on the ground level with buildings uniformly one-story in height, makes it ideal for the storage of heavy machinery. The transaction with the Harvester organization, is the latest of a series of deals through which the old Moline Plow Co. is disposing of properties not essential in the operation of the Moline Implement Co., successor to the latter.

Others to Be Sold

Negotiations are now under way for the disposal of the Freeport, Ill., plant where Stephens automobiles were manufactured. Plant No. 2 there has already been sold, while a deal for plant No. 1 is likely to be transferred shortly. The factory at Poughkeepsie, N. Y., where the Moline Plow Co. manufactured harvesting machinery, is also on the market and will likely be disposed of in the near future. The Freeport and Poughkeepsie properties are the principal outside holdings of the parent concern which have not yet been sold.

In Moline, the company still has possession of the o'd building known as the print shop and a warehouse on Eighteenth Street. The equipment of the print shop has been sold, while the wagon works owned at Stoughton, Wis., were disposed of some weeks ago. The plant just sold to the International is regarded as the most complete and up-to-date industrial structure in the Tri-Cities. It is generally believed by men familiar with the implement business, that the International will eventually utilize it for manufacturing purposes, and that the proposed use for a warehouse and distributing purposes, is merely temporary.

BLAMES AUTOMOBILE FOR FURNITURE LOSS

GRAND RAPIDS, Aug. 13—Speaking before the furniture dealers convention here, a Detroit merchant blamed the automobile for a falling off in the furniture trade.

"If buyers are not doing well they will not go to market, as a general rule," he said. "Many will not be here because of the unprecedented number of automobiles that are being sold this season—that business is hurting our business. When a man can buy an automobile at $12.60 down, he listens well to the automobile salesman. To be sure the buyer does not take his own sweet time to pay the balance. Oh, no; he gets two perfectly good signers on his little bundle of notes, and he pays up as promptly as though it were a straight loan from the bank. And there is no come-back, if the goods are not wanted. Now with us, if they buy on the installment plan, we too often have to take back the goods, repair them and put them on the floor and cut the price. We even lose sometimes when the buyer slips out of town and leaves us holding the bag.

"Yes, sir, it is the automobile that is hurting the furniture business, and that is why many, many buyers are not here. The automobile men are smarter than we are for they find ways of getting the money. We cannot get along without the cars, so we must devise ways of getting our money out of our sales without so much loss."

Build Automobile Cars for C., M. & St. Paul Co.

MILWAUKEE, Aug. 12—One thousand new automobile cars being built for the Chicago, Milwaukee & St. Paul Railroad will be rushed to Milwaukee within the next few weeks to the plant of the A. O. Smith Corp., where they will be loaded with automobile frames and sent into the automobile manufacturing territory. The automobile cars are among the first deliveries of the 7,500 freight cars which nine different manufacturers in various parts of the country are building for the railroad. Starting with Aug. 1 deliveries of the new cars numbered about 40 a day but before the month is over this will have been increased to 170 daily.

GREECE BANS IMPORTS

WASHINGTON, Aug. 12.—Importation into Greece of automobile passenger cars has been prohibited for six months, according to a cablegram to the Department of Commerce from Acting Commercial Attache C. E. Dickerson, Jr.

Propose Uniform Highway Signals

Next Hoover Conference to Consider Plan to Safeguard Railroad Crossings

WASHINGTON, Aug. 12—Uniform signals for highway traffic control at railroad grade crossings will be considered at the next Hoover conference on State and highway safety, it was learned at the Commerce Department today.

There are at present in the United States 208,688 unprotected grade crossings. The casualty list at crossings last year was 2,149 killed and 6,535 injured.

"Establishment of a well worked out standard system of signals, together with the standard fixed warning and direction signs, will reduce the hazard to public safety," Thomas P. Henry, president of the American Automobile Association, who is sponsoring the move, said.

In addition to signals at crossings and watchmen wherever possible, the conference will consider the following:

1. Smoothing out the approaches to crossings so as to do away with steep grades and sharp inclines that endanger operation of automobiles at crucial moments.

2. Improving the physical condition of crossings so as to prevent stalling of machines on raiload tracks.

3. Development of a plan of States, towns and communities whereby, in cooperation with railroads, grade crossings will be ultimately eliminated.

"While we are constantly told that $19,000,000,000 would not eliminate every grade crossing in the country, I am convinced that even $1,000,000,000 would do away with 50 per cent of the present hazard," Henry added.

RUN GAS-ELECTRIC TRAIN

MILWAUKEE, Aug. 12—The first gas-electric driven passenger train to make regular runs out of Milwaukee has been put on by the Chicago, Milwaukee Northwestern Railway. The two-car train will operate between Milwaukee and Adams, Wis., a distance of about 125 miles, leaving Milwaukee in the afternoon and returning the following morning. The outfit has a large gasoline motor which runs a generator. The generator in turn supplies the power which drives the cars along. In coming to Milwaukee from Chicago the new train operated on the same running time as the crack inter-city steam trains of the road.

NEW MEMBERSHIP RULE

NEW YORK, Aug. 13—The Trailer Manufacturers Association of America has amended its by-laws so as to permit truck and tractor builders to join as associate members, a privilege formerly limited to manufacturers.

Report Army Motor of Superior Merit

American Chemical Society Learns of Truck Engine Using Ethyl Gas

LOS ANGELES, Aug. 12.—That the United States Army has developed a motor truck engine embodying radical changes from the usual type of internal combustion motor, which is reported to be able to deliver an increase of 28 per cent in power with a decrease of 20 per cent in fuel consumption, was the report given to the national convention of the American Chemical Society, in session in Los Angeles.

The convention was told that this motor was developed to meet the recently perfected ethyl gasoline, and will not use the standard fuel. With the specially treated gasoline it will outclass anything in its reach and will climb hills and pull exceedingly heavy loads with surprising ease, engineers say.

The new motor was developed at Camp Holabird, Md., by Arthur W. Harrington, chief engineer of the Motor Transport Division, Q.M.C., and other army engineers. The exact nature of the fuel to be used in this motor was not disclosed at the convention. It is known, however, that the gasoline intended for the motor is of the type treated with tetraethyl lead.

Resembles Old Model

The motor was built of parts used in government Class B. trucks. To outward appearance it is exactly like the old type of truck, but internally it has been redesigned to work under pressure much greater than the usual motor is required to withstand.

A statement by Dr. T. A. Boyd of the General Motors Research Laboratory at Dayton, Ohio, on the subject of chemical research on automobile fuels, was made public by the American Chemical Society at the convention in connection with the development of the new type of motor.

If the chemists are able to develop a fuel that will increase the useful store of energy in the gasoline being burned by the motor from 3 to 5 per cent to approximately 10 per cent, the saving to motorists would mean an average of $50 a year per registered vehicle, Dr. Boyd declared.

The search of the chemists for such a fuel was partly rewarded, Dr. Boyd stated, in the perfection of the ethyl gas.

Another discussion at the American Chemical Society's national convention which will be of interest to the automotive industry was led by Dr. Harrison Howe, of Washington, editor of *Industrial and Engineering Chemistry*, the official organ of the society.

"Methanol, a new form of fuel developed by the Germans may take the

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FINANCIAL NOTES

Richmond Radiator Co. stockholders have voted to retire the preferred and common stocks and issue new stocks in exchange on the basis of three shares of new no par preferred for each share of the present $100 par preferred and all its rights, while two shares of new no par common will be given for each present $100 par common share.

New preferred stock will carry dividend rights as follows: $3 a share cumulative; $1 a share non-cumulative, payable before dividends can be declared on the common stock; one-half of the total of any cash distributed on the common stock up to, but not exceeding, $1 a share. Stock will be callable at $65.

Glidden Co. stockholders approved the proposed increase in the company's no par value common stock from 360,000 to 500,000 shares. They also approved the sale of 40,000 shares at $20 a share to stockholders, who will receive the right to subscribe for one share for each nine shares held at the close of business July 22.

Stock not taken by the shareholders will be disposed of as the directors may decide. Stockholders have received a notice to the effect that the company expected to put the stock on a $2 annual dividend basis before the end of this year.

Union Trust Co. of Pittsburgh, trustee of the $1,000,000 annual sinking fund securing issue of Aluminum Co. of America $18,000,000 12-year 7 per cent sinking fund debenture gold bonds, will receive tenders for the sale to it of $1,000,000 of the bonds at prices less than the face value plus interest accrued.

Goodyear Tire & Rubber Co. declared regular quarterly dividends of 2 per cent on the prior preferred, payable Oct. 1 to stock of record Sept. 15; and $1.75 on the preferred, payable Oct. 15 to stock of record Sept. 15.

The Glidden Co. has made application to the New York stock exchange to list for trading 77,045 additional shares common stock, without nominal or par value; $7,201,300 prior preference stock.

Hudson Motor Car Co. has applied to the New York Stock Exchange to list 10,000 additional shares capital stock, without nominal or par value.

Aluminum Co. of America has called a meeting of stockholders for Oct. 7 to vote on changing the 1,500,000 authorized shares of $5 par to common capital stock no par.

Gabriel Snubber Manufacturing Co. seeks to list 198,000 shares Class A common stock, without nominal or par value.

Norwalk Tire & Rubber Co. stockholders have ratified an increase in common from 100,000 to 150,000 shares par $10, proceeds to be used to retire $750,000 ten-year 7 per cent sinking fund gold notes which constituted the company's only funded debt.

Pierce-Arrow Motor Car Co. on Oct. 1 will redeem for cash all outstanding prior preference stock at $100 per share, plus quarterly dividend of $2.

Briggs Co. Has $1,678,449 Net

NEW YORK, Aug. 12—The Briggs Manufacturing Co. for the three months ended June 30, 1925, reports net income of $1,678,449, after all deductions, including reserves for depreciation, taxes and other accounts.

Steel Orders Large Considering Season

Automotive Demand Holds Firm with Call for Immediate Shipment

NEW YORK, Aug. 13—The steel market's immediate appearance lends itself to various interpretations. Absence of ups and downs in prices leads in many quarters to the market being called steady while others go so far as to characterize it as being in equilibrium, meaning thereby that perfect harmony prevails in the price views of buyers and sellers. There is only one fair way in which to prove or disprove the state of a market, and this is on the basis of a representative number of representative transactions. And these, alas, are wanting.

Considering the season, the number of orders is large, especially so from automotive consumers, nearly all of whom urge immediate shipment of whatever they order, but none of these orders involves representative tonnages, such as might be accepted as a fair test of the market. Whenever slightly more than piecemeal buying is in evidence—and it need not be very much more—the prevailing quotation for many products is subject to a dent of $1 or so per ton.

No Heavy Tonnage Sought

While some mills were talking of lifting black sheets to a 3.20c. base, others seemed not unresponsive to bids of 3.10c. Slightly broadened buying of cold-finished steel bars is attributed to concessions from the 2.60c. base price. Prices for both hot-rolled and cold-rolled strip steel are held fairly well, but buyers make so many bites of their cherries that there is no telling what would happen if a really worth-while tonnage were sought.

A long range view of the market outlook must be predicated, however, on considerations quite different from this condition of relative price stagnancy. The leading interest's unfilled tonnage statement for July 31, published on Monday, shows a further diminishment of the backlog by 170,991 tons. Last year's unfilled tonnage registered declines up to and inclusive of July. In August bookings began to outweigh shipments, and from then on unfilled orders climbed steadily until the end of the year and until February of the following year. While there have been years in which the fourth quarter was not productive of an increase in the steel demand, present conditions, with all the hand-to-mouth buying that has been in evidence, favor a decided upward climb in demand during the year's last four months.

Will this increased demand be so "bunched" as to drive prices upward? Will the coal strike, if it materializes, make for less resistance to an upward

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Edsel Ford Denies Control of Hudson

Declares Company Is Not Seeking to Acquire Possession—Hudson Assets $51,071,202

DETROIT, Aug. 13—Edsel Ford has issued a formal denial of persistent reports that the Hudson Motor Car Co. has been acquired, or was being sought by the Ford interests.

"There is not now and never has been the least foundation for the rumor that the Ford Motor Co. has acquired or is seeking control of the Hudson Motor Car Co." he said. "This rumor has persisted until in some quarters sheer repetition has given it a status of fact. For this reason we now make formal denial and state that the rumor in all its forms is unfounded."

Hudson Statement Issued

At the same time, the Hudson Motor Car. Co. issued its consolidated balance sheet as of May 31, as follows:

Assets: Cash, $6,992,791; U. S. Treasury notes and Liberty bonds, $15,000,000; inventories, $9,038,534; other current assets, $6,124,665; investments, $81,860; real estate, plant equipment, etc., after depreciation, $13,420,713; deferred expenses, $412,639; total, $51.071,202.

Liabilities: Current accounts payable, $12,474,199; taxes, payrolls and sundries accrued, $1,897,406; reserves for Federal taxes and contingencies, $2,181,663; capital stock (represented by 1,320,050 no par shares and 100 $10 par shares), $16,501,625; surplus, $18,016,309; total, $51,071,202.

Report New Army Motor of Superior Performance

(*Continued from page* 275)

place of gasoline in time," said Dr. Howe. "This fluid, which is derived from elements that are among the most abundant in nature possesses all the properties of wood alcohol, which is distilled from different kinds of wood, and may be used for the same purposes. About the only respect in which it differs is that it does not have the characteristic odor of wood alcohol.

"The Germans are carefully keeping the formula for methanol to themselves and are producing large quantities of it, exporting a good deal to this country."

Dr. Howe predicted that American chemists will eventually learn the secret and that the new fuel may some day become popular as a power producer.

REORGANIZING HOLYOKE TIRE

HOLYOKE, Aug. 12.—The New England Tire & Rubber Co. is working out plans for reorganization and producing again the Holyoke tire.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Aug. 13—Increased trade volumes were reported in several important lines last week. Commodity prices in general continued to rise. Crop weather was fairly favorable.

The official crop report based on condition Aug. 1 shows deterioration during July in several of the most important crops. The indicated yield of corn is reduced by 145,000,000 bushels to 2,950,000,000 bushels; spring wheat 13,000,000 bushels to 263,000,000 bushels; and all wheat, 1,000,000 bushels to 679,000,000 bushels. Indicated yields of oats, barley and white potatoes are larger than a month ago. The cotton crop forecast is for a yield of 13,566,000 bales, as compared with 13,588,000 bales on July 16.

Production of pig iron last month amounted to 2,664,024 tons, comparing with 2,673,457 tons in June and 1,784,899 in July last year. The average daily output was 85,936 tons, as against 89,115 in June and 57,577 a year earlier. Steel ingot output totaled 3,087,590 tons, as compared with 3,207,056 in the preceding month and 1,877,789 a year ago, while the daily average of 118,753 tons compared with 123,348 in June as 72,223 in July last year. Unfilled orders reported by the United States Steel Corporation declined further from 3,710,468 tons on June 30 to 3,539,467 on July 31, comparing with 3,187,072 on July 31, 1924.

Car loadings in the week ended July 25 numbered 1,029,603, setting a new record for the current year, and comparing with 1,010,970 loadings in the preceding week and 926,409 in the corresponding period a year ago. Net operating income of Class 1 railroads in June amounted to $91,716,862, as compared with $65,806,740 in June last year. For the first six months of the year the total was $437,668,257, representing an annual return of 4.46 per cent on the property investment, as against 4.12 per cent in the first half of 1924.

A slight increase in crude petroleum production occurred in the week ended Aug. 1, with a daily average output of 2,114,400 barrels comparing with 2,111,750 barrels in the preceding week and 2,005,100 a year ago.

Bank debits to individual accounts reported by the Federal Reserve Board for the week ended Aug. 5 exceeded by 11.5 per cent the total for the preceding week, and by 12.3 per cent that for the corresponding period last year.

Fisher's index of wholesale commodity prices stood at 161.4 last week, comparing with 160.8 a week earlier and 159.3 four weeks earlier.

G. M. Declares Extra Dividend on Common

Earnings Justify Added Payment of $1, Says Sloan—Costs Are Lower

NEW YORK, Aug. 13—General Motors Corp. directors today reelected officers and declared regular preferred and debenture dividends payable Nov. 2 to stockholders of record Oct. 5, also $1.50 per share and an extra $1 cash dividend on common, payable Sept. 12 to stockholders of record Aug. 24.

"The Board felt," said Alfred P. Sloan, Jr., president, "that this extra disbursement was due because of the corporation's very strong financial position and its very satisfactory earnings for the first half.

"The new series of cars recently announced have been received by the public beyond all possible expectation. Every effort is being put forth to get production up to sale. While the new offerings have been made at somewhat lower prices they reflect largely economies in manufacture and more intensive engineering. This is particularly true of closed bodies. The corporation's percentage of closed bodies was 43 per cent in 1924. This is now above 65 per cent. This results in lower costs, reflected in lower list prices, it being our policy to pass on to the public added value in lower lists wherever possible."

Steel Orders Are Large Considering the Season

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price movement? Does the sharp advance in the market for steel scrap that has taken place in the last few weeks denote confidence on the part of steel producers in likewise higher returns for the products into which they will fashion this scrap? These are the questions astute steel consumers are asking themselves.

Pig Iron—Automotive smelters are buying routine tonnages here and there, prices ruling unchanged.

Aluminum—No changes have occurred in the price situation. The market is quiet.

Copper—The tendency of the market is still upward. Automotive consumers of copper and brass products covered themselves partly before the recent advance.

Tin—With the price for Straits tin hovering close to the 60c. level, unprotected consumers are only buying what they urgently need.

Lead—Higher prices and premiums for spot metal on top of these have once more made the lead market a precarious affair. Storage battery makers appear to be protected by contracts.

Zinc—Firm.

Discredit Reports of Synthol Fuel

General Motors, du Pont and Standard Oil Deny They Will Produce It

NEW YORK, Aug. 12 — Sensational news dispatches concerning a "new" synthetic fuel termed synthol and assertions that it is to be produced by General Motors and other du Pont interests in cooperation with the Standard Oil Co. are discredited in authoritative circles here. Officials of the Standard Oil Co. of New Jersey deny that they have any intention of marketing any new synthetic fuel, while President Alfred T. Sloan, Jr., of the General Motors Corp. characterizes the statements that his company is to make the fuel and a new high compression engine giving double the power for the same weight, as being ridiculous on their face and without the slightest foundation.

Both General Motors and Standard Oil officials still are interested in ethyl gasoline and still are awaiting the report of the Surgeon General in respect to the effect upon the public health of the use of this fuel, but this is in no way related to the fuel termed synthol, the manufacture of which is said to be covered by German patents turned over to the Chemical Foundation, Inc., by the Alien Property Custodian and recently "discovered" by a Government chemist engaged in preparing a Department of Commerce circular about methanol.

Methanol Is Not New

Methanol is the chemist's name for wood alcohol, otherwise known as methyl alcohol. This product is one of a number obtained in this country by the distillation of wood and is used to some extent in the automotive industry, but not as a fuel. During the war German chemists developed a process for producing methanol by the hydrogenation of carbon monoxide gas, made from coal. This process is carried out under very high pressure and a temperature of about 800 deg. Fahr. in the presence of zinc oxide as a catalyst. Patents covering the process were taken out in this country as well as in Germany and the contents of these patents are not new by any means to chemists familiar with the art.

The processes involved, in fact, have been discussed in papers presented before chemical societies and, while it is realized that they present some exceedingly interesting possibilities in the way of producing important articles of commerce some of which are used by the automotive industry for other than fuel purposes, it is realized that it would take years to construct plants for their production in quantity in this country and that even then there is no certainty that the products turned out could compete in price with petroleum derivatives such as gasoline.

Methanol imported from Germany, where extensive facilities for its production exist, is reported to sell in this country for about 44 cents a gallon.

Synthol is the name given to a mixture of substances somewhat similar to methanol in chemical structure and produced by similar methods. It can be used as a fuel, but the cost of production is believed to be very much higher than that of gasoline, so that its use in this country as a motor fuel is not considered likely, at least for many years to come.

Hydrogenation products made by methods similar to that used in the production of methanol include aldehydes, acids, ketones and alcohols, several of which are required in the manufacture of materials used in the automotive industry. Formaldehyde, for example, is one of the important components of Bakelite, while some of the alcohols are used extensively as solvents for lacquer employed in the finishing of passenger car bodies. It is reported that formaldehyde has been used with urea in Austria for the manufacture of malleable glass—a product which might find a wide market in the automotive industry if made available at a reasonable price.

Thus it will be seen that the processes referred to above may become of considerable importance, direct or indirect, to the automotive industry, though at present they are not in use commercially on this side of the Atlantic so far as can be learned.

YOUTH SEEN AS AID TO MOTOR SAFETY

ATLANTIC CITY, Aug. 11—"There will be proportionately fewer traffic accidents when the present generation passes on and motorcars are driven by the younger generation. The boys and girls of today are growing 'motor wise' while the older generation had to adapt itself to automobiles."

This prediction was made to the convention of the Automobile Trades Association Managers in session here today by Robert E. Lee of St. Louis, its President.

Dodge Exports Increase with Plants at Capacity

NEW YORK, Aug. 13—Exports of Dodge automobiles in 1925 are expected to be 40 per cent larger than last year, according to E. G. Wilmer, Chairman of the Executive Committee of Dodge Brothers, Inc. He said the company had been developing the foreign field aggressively, taking advantage of the worldwide improvement in purchasing power which has added to the export movement of American automobiles.

Amended Excise Tax to Aid Parts Makers

New Regulations Retroactive to July 3, 1924, Lift Heavy Burden

WASHINGTON, Aug. 12—Parts and accessories manufacturers are expected to benefit considerably from amended excise tax regulations issued by the Treasury Department covering automobile and motorcycle parts and accessories. These items under the ruling are exempt from taxation when used with articles other than automobiles or motorcycles.

The new regulations, which are retroactive to July 3, 1924, made a drastic change in the administration of excise taxes on automobile parts, which hitherto were taxed even when used on motor boats, tractors or airplanes, or in other industries. A substantial volume of sales to these allied and outside interests is already maintained by the parts and accessories manufacturers.

Amendment Quoted

The amended regulations provide that the last paragraph of Article 16, Regulations 47, 1924, edition, are to read as follows:

"Parts or accessories for automobile chassis, automobile bodies and motor cycles primarily adapted for use on or in connection therewith when sold by the manufacturer thereof and used for any other purpose are not taxable, provided the purchaser files with his order a statement that such parts or accessories are to be used on or in connection with another article of commerce and enumerated in sub-division (1), (2) or (3) of Section 600 and further provided that the parts or accessories are used according to the certificates.

"For example, a self-starter primarily adapted for use on an automobile if sold to a manufacturer of motor boats, such manufacturer stating in his order that it is to be used in the manufacture of a motor boat and not upon an automobile, is not taxable provided it be used in accordance with the certificate."

MARTIN PARRY GAIN LESS

NEW YORK, Aug. 12—The Martin Parry Corp. reports net profit of $103,939 for the quarter ended June 30. This equals 83 cents a share earned on the 125,000 shares of no par value capital stock. In the first quarter the company reported earnings equal to 41 cents a share on the capital stock, against $1.22 a share earned on the 100,000 shares of capital stock outstanding in the second quarter last year.

For the half year ended June 30 the company reports net profits of $155,201, equal to $1.24 a share on the capital stock, against net profits of $262,368, equal to $2.62 on the capital stock, reported in the first half of 1924.

Men of the Industry and What They Are Doing

Germans Visit Detroit

L. Bruckmayer, president of the General Sportive Commission of the Allgemeine Deutsche Automobil Club A. D. A. C. of Munich, Germany: Dr. F. Krueger, vice-president of the Allgemeine Deutsche Automobil Club, A. D. A. C., Dresden, Germany and P. Jockel, member of the Sportive Commission for Motorcyclists Allgemeine Deutsche Automobil Club, N. D. A. A. of Cologne, recently paid a visit to Thomas P. Henry, president of the A. A. A. and of the Detroit Automobile Club for the purpose of discussing problems of general interest to motorists of this country and Germany. The three visitors are in this country to plan for a reliability run of German-made motorcycles to be held next summer between New York and San Francisco, originally scheduled for this year.

Dunlevy Directs Sales

The Climax Engineering Co., of Clinton, Iowa, last week announced the appointment of Lorimer Dunlevy, who has been works manager since he joined the force two years ago, to sales manager, succeeding Edward Crowley, who is establishing his own Pacific Coast agency. General Manager Rowan also announced other advancements in the personnel: H. E. Riggs, planning engineer to production manager; E. A. Rapp from foreman to general superintendent, and J. L. Engler from tool room foreman to general foreman.

Roberts Leaves Velie

Arthur O. Roberts, assistant advertising manager for the Velie Motors Corp., Moline, Ill., has resigned the position he has held the last year to join the advertising staff of the Miller Rubber Co. in Akron, Ohio. Max H. Romig, advertising manager for Barnard & Leas six years, has been appointed to the Velie advertising staff to succeed Mr. Roberts.

Knapp Quits Association

A. J. Knapp who, for the past six years has been identified with the Iowa Automotive Merchants' Association, has resigned his position as secretary-manager, his resignation to take effect September 1. Mr. Knapp is resigning to associate himself with a large development project at West Palm Beach, Fla., where he will make his home.

Jacobson Sails Abroad

Birger Jacobson, who is now associated with the export department of the Chrysler Corp., has just sailed for Scandinavia, where he will spend some time in extending Chrysler marketing activities. Mr. Jacobson has been active in automotive export work for a number of years, having represented various American manufacturers in Europe.

CHRYSLER APPOINTS NEW SALES DIRECTORS

DETROIT, Aug. 12 — Appointment of three directors of sales and two assistant directors has been announced by J. E. Fields, vice-president in charge of sales for the Chrysler Corp.

The new sales directors are Joseph W. Frazer, covering New York City, Detroit, Minneapolis, St. Louis and Dallas; J. L. Justice, Chicago, Philadelphia, New Orleans, Portland, Ore., and Cleveland; and Henry T. Myers, formerly with the Studebaker Corp., now covering Boston, Pittsburgh, Atlanta, Kansas City and San Francisco.

John McCardle, formerly head of the car order division, is assistant to Justice and S. W. Monroe, formerly supervisor of sales in the Boston district, assists Myers.

John J. Plath and Arthur T. Stanton have resigned as sales directors to become Chrysler distributors in Miami, Fla., and Columbus, Ohio, respectively.

McCleary Is Promoted

E. T. McCleary, works manager of the Youngstown, Ohio, Sheet & Tube Co., in the Youngstown district has been promoted to assistant vice-president and will share with Vice-presidents C. S. Robinson and W. C. Reilly in the management of the company's extensive properties. Frank C. Farrel has been named works manager to succeed McCleary.

Returns From Europe

E. J. Fullam, secretary and treasurer, and W. F. Slomer, general sales manager, of The Fellows Gear Shaper Co. of Springfield, Vt., have returned from an eight weeks' trip to Europe where they visited the representatives of The Fellows Gear Shaper Co. in England, Belgium, Holland, France, Germany, Switzerland and Italy.

Tomlin Advances

Lee W. Tomlin, assistant to the general manager, Remy Electric Co. plant, Anderson, Ind., has been appointed assistant to the general manager of the General Motors Export Corp. E. Hall of the sales office of the Remy company at Detroit has been appointed to succeed Mr. Tomlin as assistant to the general manager at Anderson.

Henderson Is Promoted

Frank A. Henderson has been appointed general sales manager of Community Motors, Inc., distributors of Oakland automobiles in Chicago. Mr. Henderson previously was general sales manager of the Goodyear Rubber Co. of Akron, and also district manager of the Willys-Overland Co. at San Francisco.

Hitzel Directs Service

Harry E. Hitzel of Cleveland, Ohio, has been appointed service manager of the Gibson Motor Co., Des Moines, Iowa. The Gibson Motor Co. is Iowa distributor for Chandler and Cleveland cars. Mr. Hitzel formerly was connected with the Chandler factory.

Chadbourne Returns

Thomas L. Chadbourne, director of Mack Trucks, Inc., and other corporations, has returned from Europe on the Mauretania. He has been ill and will rest a few days on his yacht before resuming active business.

Robert Lanzing Resigns

Robert Lanzing, vice-president and general manager of the Nash Cincinnati Motors for the last three years, resigned last week. He contemplates taking a few weeks' rest before announcing any future plans.

Jennings Is Secretary

J. J. Jennings will continue as secretary and treasurer of the C. G. Spring & Bumper Co., Detroit, but much of the routine work of this office is now being handled by M. D. Harrison, assistant-secretary and assistant-treasurer.

Sumner Is Sales Chief

E. P. Telotte of the Telotte Buick Co., Detroit, has announced the appointment of W. S. Sumner as retail sales manager. Both men were at one time associated with the Buick branch office in Detroit.

Bates Gets Promotion

George F. Bates, formerly assistant Chicago branch manager of the Diamond T Motor Car Co., builders of trucks, has become corporation sales representative of the organization.

McConkey Goes West

C. D. McConkey, formerly of Cleveland, has been appointed general sales-manager of the John G. Wollaeger Co., Studebaker distributor for Wisconsin, with Milwaukee headquarters.

Bull Joins Apperson

D. E. Bull has been added to the staff of the Apperson Motor Car Co., as wholesale representative at the Chicago branch.

Rubber Famine No Longer Threatens

Hoover to Confer with Association Men on Plans for U. S. Conservation

NEW YORK, Aug. 13—With crude rubber moving downward toward a normal price, the supply is increasing and there is less apprehension on the part of manufacturers than there has been in months.

A committee from the Rubber Association of America, headed by A. L. Viles, secretary and general manager, will consult with Secretary Hoover in the near future, to devise some method by which the industry will be placed on a basis less dependent on British rule. Mr. Viles conferred with Secretary Hoover last week.

Hoover is giving considerable attention to the question of simplification and standardization of rubber products, such as automobile tires, with a view to cutting down the amount of crude rubber being utilized in their manufacture. It is expected that some suggestions along this line will be forthcoming as one means of operating in the face of reduced supplies of crude rubber.

Akron Sees Plentiful Supply of Rubber Ahead

AKRON, Aug. 13 — Crude rubber, which a few weeks ago was skyrocketing above $1 a pound to the consternation of American consumers, is believed by some observers here to be headed toward the 50 cent level.

Whereas, a few weeks ago fear was expressed of an impending rubber famine, indications now are that the commodity will be much more plentiful in the near future.

Continuation of the downward movement undoubtedly will result in lower prices for automobile tires and inner tubes, which were increased from 40 to 60 per cent this spring and summer because of higher crude rubber costs.

While the Government did not officially provide for more than the expected 10 per cent increase in exports Aug. 1, a leak is believed to have developed in the Stevenson restriction plan, whereby more rubber can be obtained for consumption.

Future positions in the market have been particularly weak, indicating larger supplies will be available next year, according to local rubber brokers. Various grades of rubber can now be bought at 50 to 67 cents a pound for delivery in October and December.

Final returns for July will show deliveries totalling approximately 29,500 tons of rubber. About 5,000 tons have been delivered during the current month. A small increase also was noted in surplus stocks in London.

BLAMES ACCIDENTS TO SLEEPING DRIVERS

NEW YORK, Aug. 12—The suggestion that many unexplained fatal motor accidents of late were due to overwrought drivers falling asleep at the wheel is advanced by a British medical journal, according to a cable to the New York Times. Weight is given to the idea by the case of a New Castle doctor, who before dying recently from injuries said he had dozed off just before the accident and could not wake up. "An accident," says the journal, "may easily occur with an overtired driver soothed to greater somnolence by the rhythm of the engine and the monotonous grind of the gear. Medical men are more liable to fall asleep than others because of their long day's work without sleep. Motorists who are very tired would be wise to refrain from driving on monotonous country roads."

Hood Rubber Co. Calls Convention of Workers

BOSTON, Aug. 12—The Hood Rubber Co. held the biggest convention of its career here the past week when men from all parts of the country were present with the factory executives and workers going into all details of the rubber business including the manufacture and sale of tires. There were more than 200 branch managers alone in attendance. The convention was under the direction of T. R. Stearns, with an able committee. L. Lawrence Muench was in charge of the sessions on production; W. W. Duncan, general sales manager, had charge of the sales promotion meetings; A. R. Howell directed the discussions on advertising policies. The delegates were housed at Nantasket Beach.

STRAITS RUBBER GAINS

SINGAPORE, Straits Settlements, Aug. 5 (*by mail*)—Estimates by the Rubber Controller show the rubber available for export during the present quarter will exceed that available last quarter by about 6,500 tons.

The British Colonial Office in London announced ten days ago that an increased supply of rubber would be allowed to be exported from Ceylon, the Straits Settlements and the Federated Malay States. The increase, it was said, would amount to about 10 per cent over the exports permitted the last three months.

This action followed representations by American and English rubber interests that the legislative restrictions on the export of crude rubber has brought a sharp increase in prices. The Rubber Association of America was most active in the movement.

Report Philippines Will Raise Rubber

Commerce Department Completes Survey of Islands and Sees Big Prospects

WASHINGTON, Aug. 13—The Philippine Islands give promise of eventually bringing to the American rubber user a part of his crude supply.

The Commerce Department, in a report today on an exhaustive investigation of the potential value of the archipelago for crude rubber, expressed the opinion that profitable production is possible there. The report, representing many months of study, held that under favorable conditions an annual maximum output of 70,000 tons could be produced in the islands, in the southern portion of which approximately 1,500,000 acres are suitable for rubber raising.

The lack of political distrurbances and the utilization of the present available labor forces in the islands were stressed as factors in reaching this estimate.

Competition Needed

The report marks the completion of another stage in the department's worldwide survey of the rubber situation, started eighteen months ago at the instance of Congress and the rubber trades when it became apparent that the legalized restriction of the plantation rubber output in British possessions might work a hardship on American consumers. In recent months high rubber prices feared by the American industry at the outset of the British restriction pogram, have been realized.

Previous department reports have dealt with the British program as now established in that nation's colonies, while today's report was devoted to a study of the possibility of creating competitive plantation areas in the Phillippines. The investigation is being continued to study the advisability of expanding the crude output of South America, Africa and the Caribbean area.

In the Philippines, the survey disclosed, there is considerable commercial rubber planting now under way with sufficient plantations in cultivation to give a highly favorable hope of the islands becoming a new source for rubber.

FRENCH TIRES ADVANCE

PARIS, Aug. 5 (*by mail*)—French tire manufacturers today announced an increase of 35 per cent on tubes and 27 per cent on casings, to go into effect immediately. This measure had to be taken, it is declared, on account of the shortage of rubber and the consequent increase in cost. Michelin is of the opinion that the price of raw rubber will drop before the end of the year, and that, as a consequence, tires will be reduced.

Coming Events

SHOWS

Sept. 8-11—New Haven, Mason Laboratory, Yale University Machine Tool Exhibition, direction of Amer. Society of Mech. Eng., Chamber of Commerce and Yale Mechanical Engineering Department.

Sept. 14-19 — Cleveland, Public Auditorium, Annual Convention and Exposition, American Society for Steel Treating, W. H. Eisenman, secretary.

Sept. 21-26—London, England, Annual Cycle and Motorcycle Show under auspices of the British Cycle and Motorcycle Manufacturers and Traders Union, Ltd.

Sept. 28-Oct. 3—Chicago, Fourteenth annual Safety Congress and Exhibit, Rainbow Room, Hotel Winton, under direction of National Safety Council, A. M. Smith, business manager.

Oct. 5-9—Atlantic City, Young's Million Dollar Pier, Manufacturers' Exhibition in connection with American Electric Railway Association Convention.

Oct. 8-17—London, Olympia passenger car show.

Oct. 18-31 — Salonica, Greece, First International Sample Fair.

Oct. 29-Nov. 7—London, annual truck show.

Nov. 26 - Dec. 6 — Berlin, Germany, Annual Automobile Show in the Kaiserdamm.

CONVENTIONS

Sept. 14-19 — Cleveland, Public Auditorium, Annual Convention and Exposition, American Society for Steel Treating.

Sept. 14-17 — Automotive Electric Association, Forest Inn, Eaglesmere Park, Pa.

Oct. 5-9—Atlantic City, Young's Million Dollar Pier, American Electric Railway Association.

Oct. 7-10—Montreal, Motor and Accessory Manufacturers Association Convention.

Oct. 21-23—Boston, Fall Meeting, American Welding Society.

RACES

Sept. 7—Altoona, Pa.

Sept. 19—Syracuse, N. Y.

Sept. 30—Fresno, Cal.

Oct. 10—Baltimore-Washington Speedway, Laurel, Md.

Oct. 12—Salem, N. H.

Oct. 24—Charlotte, N. C.

Nov. 26—Los Angeles.

S.A.E. MEETINGS

National

Aug. 27—Hotel Commodore, New York, Motorboat Meeting.

Sept. 15-16—Cleveland, Production meeting and exhibition.

Nov. 12-13—Philadelphia, Automotive Transportation meeting.

Nov. — Service Engineering meeting.

Proposes Five Cent Bus Fare in Buffalo

BUFFALO, Aug. 7—Ernest M. Howe, president of the Gray Manufacturing Co., of Detroit, has proposed to establish a city wide bus system in Buffalo on a five-cent fare basis allowing transfers. City council is considering the offer.

Howe proposes to place 100 Tilling-Stevens type buses on the streets at any time his proposition is approved. These buses, manufactured at his Detroit plant, are the same type used in London, Australia and South Africa.

He explained that he is able to operate the buses on the low basis of return owing to the fact that they are operated by combined gas and electric motive power and require little maintenance expenditures. He claims that the bus will operate over 100,000 miles without having to be housed for repairs. He added that the average gear-driven bus is useless after 300,000 miles.

Street car fare in Buffalo is eight cents, or two for fifteen cents. The trolley company also operates three bus lines charging a ten cent fare. Howe agreed to meet the New York State public service commission regulations. He also offered to post a bond of $150,000 to guarantee his good faith.

Originally, Howe came here to sell buses to the city. On learning that the municipality had no legal right to operate them, he was challenged to prove that he could do it on a five cent fare basis. His formal proposition to council was the result.

QUEBEC LICENSES INCREASE

QUEBEC, Aug. 11—More than 100,000 automobile licenses have been issued from the Quebec automobile bureau in the present year. When statistics are compiled at the end of the year they are expected to exceed previous figures.

GOV. SMITH BUYS CHRYSLER

NEW YORK, Aug. 12—Governor Alfred E. Smith was among the recent purchasers of a Chrysler six from the Colt & Stewart Co.

9,445 *MILES OF ROAD RECEIVE FEDERAL AID*

WASHINGTON, Aug. 12—A total of 9445 miles of Federal aid highways were built and accepted during the fiscal year ended June 30, at a cost of $190,485,399, of which the Federal Government paid $87,801,946.

In addition to this 4587 miles were completed, but have not been accepted formally by the Government, at a cost of $105,123,086, of which Federal aid totalled $47,606,101.

If these vouchers are paid the total cost for the year will be $295,608,485, of which Federal aid will constitute $135,408,047 and the mileage total 14,032 miles.

Statistics made public today at the Department of Agriculture showed Texas led with 784 miles, built at a cost of $11,778,972 and received Federal aid of $4,867,315. Illinois built 431 miles for $13,045,775 and received $6,360,529.

Reports of the following States as regards accepted highways were included:

	Total Cost	Federal Aid	Mileage
Connecticut	$1,495,767	$549,810	28
Maine	1,263,222	607,934	50
Massachusetts	3,856,454	1,361,934	67
N. Hampshire	1,088,937	498,359	36
New Jersey	4,337,562	1,159,148	70
New York	9,735,029	3,971,232	258
Rhode Island	854,098	340,060	18
Vermont	1,003,060	510,125	31

Ford Bids $40,000 Each for Ocean-Going Tugs

WASHINGTON, Aug. 12—The Ford Motor Co. submitted to President Palmer of the Emergency Fleet Corp. a bid for seven ocean-going tugs at $40,000 each. Rear Admiral Palmer immediately transmitted a recommendation to the Shipping Board that the offer be accepted at $42,500 each. Chairman O'Connor approved the recommendation.

Chicago Prepares for Used Car Display

CHICAGO, Aug. 12—Details of the seventh annual used automobile show, under the direction of the Chicago Automobile Trade Association, are now being drafted. The show will be held at the Coliseum, October 10 to 17. These dates originally were scheduled for the enclosed car show, plans for which have been abandoned, because sanction could not be obtained from the National Automobile Chamber of Commerce.

It is believed that the show will prove more stimulating than usual, because of the time of year in which it will be held. On former occasions the exhibit has been held early in the summer.

The first used car show was held by the Chicago Automobile Trade Association in 1917 and it has been held each year since that time except in 1919 and last year. The public has been accustomed to automobile shows in the fall of the year and the exhibition this year is expected to afford dealers an unusual opportunity to move their stock when the market normally is dull.

The last exhibition was a profitable one for the exhibitors. Nearly $500,000 worth of business was done during the week. The stringent regulations imposed by the inspectors of the show upon the exhibitors have given the public confidence in the worth of the cars shown. These conditions will again be imposed this fall.

AMERICAN CARS IN BRITAIN

LONDON, Aug. 5.—During June, 1925, the last duty free month, the total value of passenger cars and parts imported into Britain was £2,527,112. The corresponding figure for last May was £1,125,902, and for June, 1924, £429,113. The number of complete cars imported last June was 9778, with a unit value of £160; against 794 in the corresponding month last year, when the unit value was £149. The jump over the total of 3540 cars for May indicates that the American car had its full share of landings during June.

AUTOMOTIVE INDUSTRIES
VOLUME 53 *New York, Thursday, August 20, 1925* NUMBER 8

What the New Models Show—

A Trend Toward

- Finer General Appearance
- Increased Engine Power
- Lower Servicing Cost
- New Low Price Levels

Four factors influence changes which have been made on the early 1926 designs. Air and oil cleaners becoming standard. Single plate clutches predominate. Brakes about the same.

By P. M. Heldt

NOW that about a dozen or more companies prominent in the industry, have announced their early 1926 models, it is possible to form an idea as to the lines along which present automobile design is progressing.

Some of the changes made are naturally of a minor character and incidental to other more important alterations, but nevertheless certain definite tendencies are discernable.

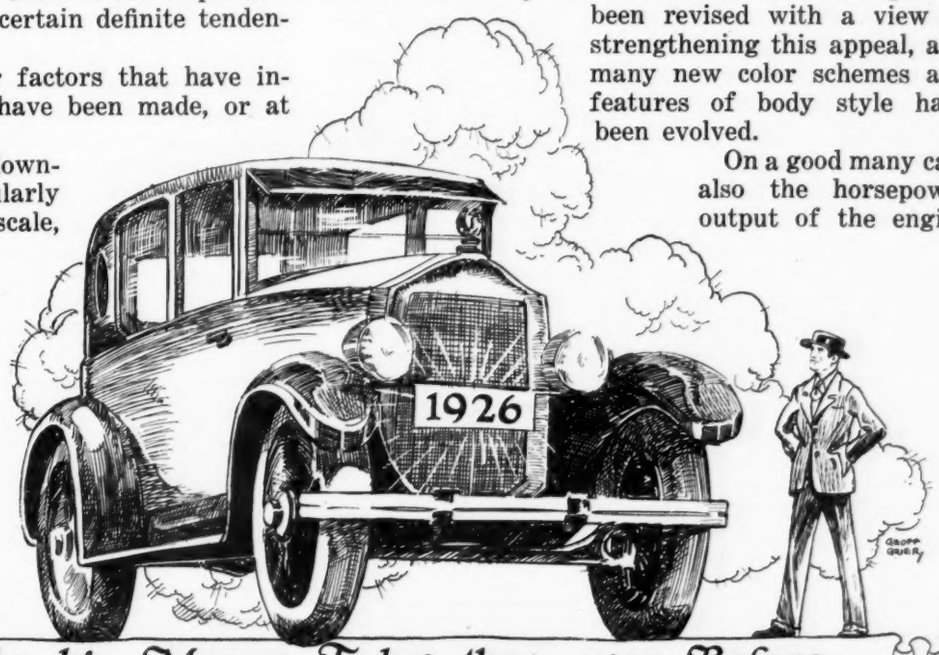
There are apparently four factors that have influenced the changes which have been made, or at least a great many of them.

The first is the prevailing downward trend in prices, particularly at certain ranges of the price scale, which has dictated economy and the elimination of unnecessary expensive features.

Second is the demand for reduced servicing cost, particularly during the first few years of a car's life. This is evidently the factor responsible for the rather widespread adoption of air-cleaners and oil-cleaners, of improved oiling systems and other features tending to prevent premature wear of certain parts. From the purchaser's point of view this is decidedly important.

A third factor has been the desire to improve the appearance of the cars, it being realized that the appeal of the outline and of the color scheme has great weight in swaying the decision of a customer who may be wavering between several competing makes. On many cars the radiator shell design has been revised with a view to strengthening this appeal, and many new color schemes and features of body style have been evolved.

On a good many cars also the horsepower output of the engine



More Car for his Money Today than ever Before

has been increased, either by refinements in design or by increasing the piston displacement. The object in view in thus increasing the available horsepower is evidently to increase the possible acceleration, or what is commonly referred to as "the performance."

There is certainly no evidence that American designers are following the lead of their European confreres and cutting down the piston displacement to save on taxes and fuel. Buick, Chrysler and Rickenbacker have increased the piston displacement of their engines (Buick of both models), while a number of other makers have endeavored to increase the output by increasing the valve opening area, enlarging the carbureter size, smoothening and straightening the inlet passage and lightening the reciprocating parts.

Torsional vibration of crankshafts seems still to be a source of considerable trouble, if one may judge from the fact that in a number of instances the crankshaft diameter has been materially increased, one case, for instance, from 1⅞ to 2¼ in., which gives an increase in torsional strength of 73 per cent as compared with an increase in piston head area (and presumably in explosion and inertia forces) of less than nine per cent.

In one case a small front flywheel has been added to check torsional vibration, while in the case of the Oakland an entirely new type of harmonic balancer has been applied, the exact principle of which has not yet been made public.

The general increase in engine speeds naturally has a tendency to bring the critical speeds of crankshafts within the operating range of the engines and calls for the use of devices of this kind.

This is the first time in a good many years that important changes have been made in the Cadillac engine, and advantage has been taken of the occasion to incorporate in it a number of features which have been worked out on other General Motors products, such as the turbulence head.

Since the majority of the General Motors makes have joined the ranks of air-cleaner users, which previously included Franklin, Chrysler, Rickenbacker and Willys-Knight, the position of that accessory has been signally strengthened, and probably it will not be many years till it will be regular equipment on practically all cars, of medium and high grade at least.

It is hardly to be expected that an air-cleaner will be of much service on a car that is operated on hard surfaced roads exclusively, but the majority of cars in this country are being operated most of the time on dirt roads which are exceedingly dusty during dry spells. Collecting the dust in a glass jar, as is done in one of these cleaners, ought to furnish convincing proof to the owner of the benefit of the device.

Along with the air-cleaner the oil-cleaner seems to be gaining in popularity. Of course, for a long time engines have been provided with oil strainers which were supposed to remove all solid particles from the oil in the sump before it entered the pump, but since the straining surface is generally of rather limited area and the oil gets very viscous in cold weather, it was necessary to use rather coarse mesh gauze which is not very effective in removing the finer particles of gritty material. A system in which the oil is forced through the straining medium by the pressure of the pump, instead of being drawn through, should, by its suction, be an important improvement.

In clutches the tendency seems still to be toward the single plate type which can be made with a minimum of spinning weight and therefore facilitates gear shifting. This type of clutch also has advantages from the viewpoints of weight and manufacturing cost. One would hardly expect it to be as durable as the multiple disk type, in which the specific pressure on the friction surfaces can be kept lower, but if provision is made to carry off the heat generated promptly so that the wearing parts do not reach an abnormal temperature a satisfactory life of the lining should be obtainable. And the cost of a single relining, naturally, is materially lower than with a multiple disk clutch.

For a number of years transmissions have been contracting in size, until the gearbox on the average six or eight-in-line is an almost insignificant extension of the crankcase. But it seems that the practical limit in that direction has been reached, and perhaps even surpassed, for among the cars of which descriptions have been printed recently there were at least two in which the face widths of the gears had been increased.

The Automobile Dollar

IT IS undoubtedly true that the 1926 car will be an all-around improvement over that of any previous year.

As a result of the improvements in engineering design and construction, and the continued general downward trend in prices, the public today is getting more automobile value per dollar than ever before in the history of the industry.

Not only that, but it gets for every dollar invested in automobiles at present prices more than 100 per cent greater value than a dollar would purchase if applied to almost any other commodity on the market.

Gear Grinding After Hardening

The application of gear grinding to transmission gears after hardening has lagged a long way behind the development of practical gear grinders, but gradually the practice seems to spread. To the several firms who have adopted it in the past there has now been added the Chrysler Motor Corp., which grinds all of the gears in its transmission that are likely to be troublesome from the noise standpoint.

In this connection it is interesting to note that Chrysler has changed from the stub tooth, in general use in transmission gears, to the full depth tooth, thus confirming the assertion which has been made by a number of investigators that the full depth tooth is decidedly more quiet, if other things are equal.

Few changes in connection with brakes are mentioned in the descriptions of new models. Those who have been using four wheel brakes continue to fit them, in most cases without alteration, while those who still maintain these brakes are not necessary on their particular models do not seem inclined to alter their position. The period of feverish activity in brake development seems to be past. In one case application of the brakes is rendered easier by giving the rear brakes a greater wrap.

Changes in body lines, in trimmings, color schemes and items of body equipment are numerous and in spite of a few instances where the chief consideration evi-

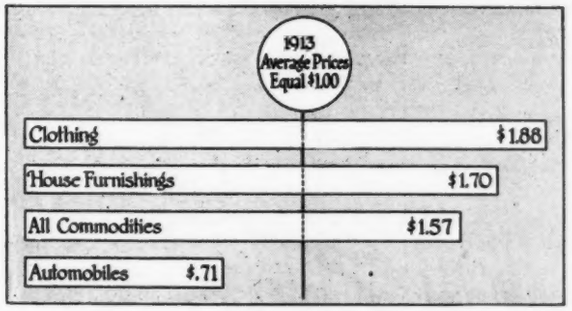
dently has been a lowering of manufacturing cost, it is undoubtedly true that the 1926 car will be an all-around improvement over that of any previous year.

As a result of the improvements in engineering design and construction, and the continued general downward trend in prices, the public today is getting more automobile value per dollar than ever before in the history of the industry. Not only that, but it gets for every dollar invested in automobiles at present prices more than 100 per cent greater value than a dollar would purchase if applied to almost any other commodity on the market.

The accompanying table shows how automobile prices have steadily decreased while prices for other products in the United States have taken an opposite course. For example, the clothing bought in 1913 for $1 now costs the public $1.88. House furnishings that sold then for $1 now have a value of $1.70. All commodities taken together have increased in price until $1.57 is required today to purchase the value of $1 in 1913.

On the other hand, the public now gets as much automobile for 71 cents as it got for $1 12 years ago, or, roughtly, 30 per cent more value for the same money.

Other industries which have been prone to criticize the automobile for cutting into their business by tying up such a large proportion of the public's purchasing power might do well to make a study of these facts. It might be found that the public to a very large extent has simply followed its natural instinct to spend where the greatest values are to be had.



Most other industries still are doing business on a war price basis, while automobile manufacturers not only have reduced prices 29 per cent below the prewar level but also have been adding constantly to the longevity and serviceability of their cars

Automobile manufacturers are continuing to build bigger values into their products year by year; they are constantly on the alert to improve the efficiency of their cars and reduce costs; they are passing on to the public the economies they effect by good business management—and they are making more money. There is a lesson in this for executives in some other lines of business.

International Railway Congress Discusses Motor Rail Cars

At the International Railway Congress recently held in London one session was devoted to Traction for Light Railways, at which a good deal of attention was given to motor-propelled rail cars. At the end of each session certain conclusions were drawn, and in respect to rail cars it was agreed that they furnish satisfactory solutions of certain problems of working, that the system is full of promise for light railways, and that every encouragement should be given to its development. It was decided that information on the cost of maintenance and on the depreciation of rail cars should be gathered and presented at the next Congress.

M. de Croes, presenting a report on light railways outside Great Britain and the United States, said that traction by means of internal combustion engines was steadily developing. In France a class of vehicle known as "autorails," which were little more than motor truck chassis adapted for use on rails, formed an economical substitute for steam trains hauling small loads, on lines where the traffic was light. Owing to their low weight and the smaller crew required, the cost of operation with autorails was about one-third that with steam traction, in spite of the high cost of motor fuel.

Diesel-electric cars, M. de Croes said, had been built in various countries, 200-250 hp. cars of this type being in use in Switzerland, while locomotives of 400 hp. and 440 hp. were on test in Italy. The high thermal efficiency of internal combustion engines, the smaller crew required to run them, the absence of fuel consumption during stops, the possibility of instantaneous starting, the small quantity of water required, the long trips which could be made on one supply of fuel, were all advantages and were the features which recommended this system of traction to managers of light railways.

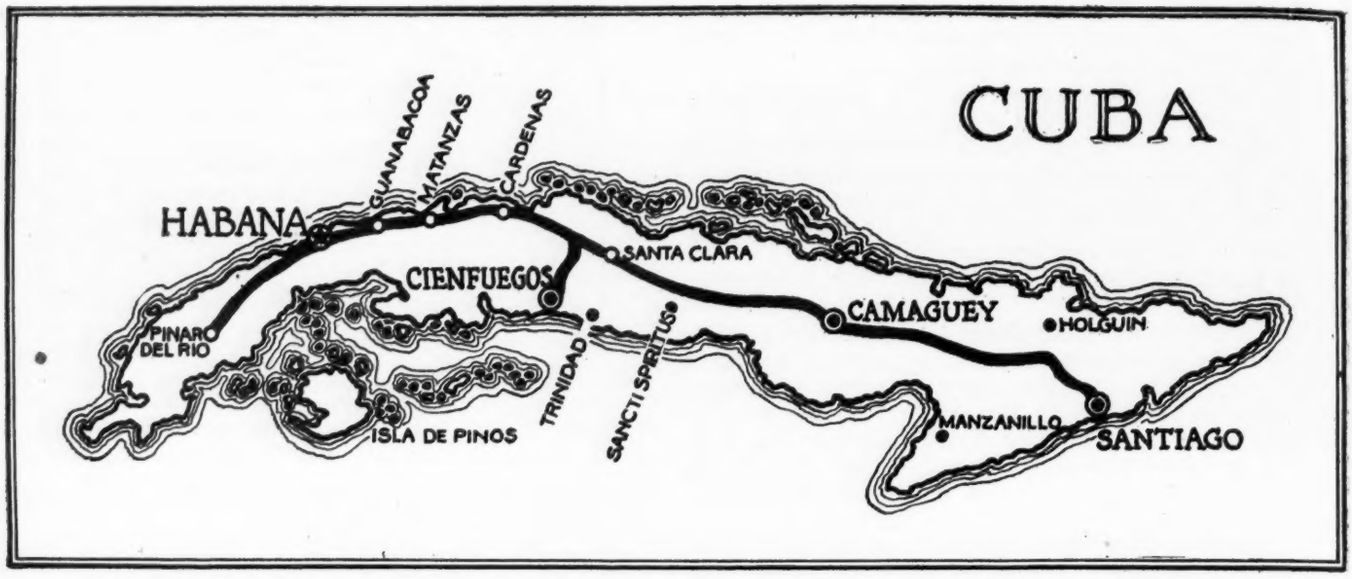
Conditions in Portugal were referred to by M. de Souza. In that country there were certain lines which require a frequent passenger train service, that is, the running of short trains at frequent intervals, and a suitable rail car was being looked for with a view to meeting this requirement. There was an excellent type of Italian rail car now in existence, the power plant of which could be readily removed when repairs became necessary.

D. Verhoop of the Hague contributed a statement about developments in Holland. All their present rail cars were fitted with mechanical transmission and their weights varied according to type from 9 tons to 34 tons. The variable speed gears used on the heavy cars of the principal railways and on the lighter cars of the street car companies were actuated by means of compressed air. For railway cars up to 22 tons weight hand operation was used.

Although definite results had not yet been published, the mechanical drive was thought to be the weak spot in the construction, not only from the standpoint of maintenance but also from those of fuel consumption and noisy running when not in top gear. Generally speaking, these cars did not give an appreciable saving in working costs. Inspection, repairs, and higher fuel costs counteracted any economies made in wages.

L. Velani, of the Italian State Railways said that their Ministry of Public Works had instituted subsidies for the fostering of investigations with internal combustion engines for railway traction. The Fiat Company in Turin had constructed a 400 hp. Diesel electric vehicle for use on light railways, which was capable of taking gradients of 1 in. 17. The chief difficulty at first was found to be vibration in the driver's cabin. This was, however, eventually overcome.

The results of working with a Tosi oil-fuel locomotive capable of developing a speed of 60 kilometers per hour (34 miles per hour) would be available in the next six months. The Fiat Company had built a 150 hp. naphtha locomotive with a speed of 50 kilometers (28 miles per hour), also a 40 hp. naphtha locomotive and the Alpha-Romeo Company were constructing 150 hp. naphtha and benzol locomotives for similar speeds.



Map showing route of the proposed new Central Highway which will form the backbone of Cuba's great $380,000,000 improvement program

Cuba Seen as Market for 250,000 New Motor Vehicles

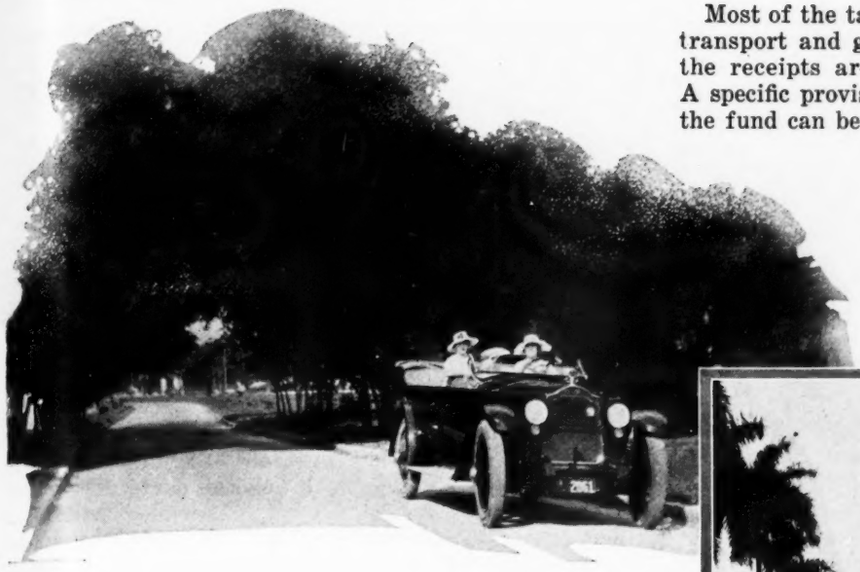
THE automobile business in Cuba is in for possibly the biggest boom in its history This optimistic forecast is based on the passage by the Cuban Legislature and signature by the President, of the Cespedes Public Works Bill, which includes provision for the immediate construction of a Central Highway some 500 miles long from one end of the island to the other and scores of feeder roads connecting all parts of the country with the Central Highway. Construction on these roads is to be started at once and simultaneously in all provinces, the entire program to be completed within four years. The cost will be over $300,000,000.

Great road-building program, calling for an outlay of $380,000,000, expected to boom automobile sales

Latest estimates give the number of automobiles in Cuba as slightly over 33,000. According to a census made in 1923 the population of Cuba was about 3,125,000 so that there are nearly 100 persons for every motor vehicle in operation. The Cubans are relatively prosperous, they live in a country with climate and scenery admirably adapted to the use of automobiles as pleasure vehicles and of course quick transportation for business purposes is as important there as anywhere else. The reason why automobiles have not been used more extensively is the lack of good roads. This is evidenced by the fact that the Province of Havana, which has considerably more motor highways than the other provinces, also has about two-thirds of all the automobiles on the island.

With the Central Highway opening up all the provinces to motor traffic from all points of the island and the numerous feeder roads to make practically all towns accessible to the Central Highway it is almost a certainty that the automobile population will double within

A section of Havana's "Automobile Row." The dealers which line this street are looking forward to an era of great prosperity when the new highways are opened to traffic



a short time and some of the Cuban automotive men predict 300,000 cars within a few years, or an increase of more than 250,000. As this number would mean only about one motor vehicle for every 10 persons it does not seem beyond reason to expect such extensive development.

In addition to the Central Highway, which will extend from the Isle of Pines through Havana to Santiago, the following work is to be performed in the six provinces:

Havana—49 roads on the main land and 10 on Isle of Pines, with paving in 31 towns.

Pinar del Rio—51 roads and paving in 17 towns.

Matanzas—43 roads and paving in 17 towns.

Santa Clara—43 roads and paving in 23 towns.

Oriente—74 roads.

Camaguey—43 roads and paving in eight towns.

The complete construction program is to be finished within four years at an estimated cost of about $380,000,000. Taxes are provided to furnish an estimated revenue of $30,000,000 per year which would wipe out the debt in 12 years, but it is expected that the development of the Island will increase the returns from year to year so that the debt will be cancelled in considerably less than 12 years.

Among important tax items from the automotive standpoint is a sale tax of 10 cents per gallon on gasoline. This seems almost prohibitive at first thought but actually under the new taxation scheme it is expected that consumers will get fuel cheaper than heretofore. For some years crude oil has been admitted practically duty free and has been refined by one company which has been charging from 36 to 47 cents per gallon. To protect this refinery an import duty of about 19 cents per gallon has been levied on gasoline. This protection has been removed and it is thought that throwing the market open to all companies will so reduce the price that even with the sales tax added the cost to the consumer will be less than he has been accustomed to pay.

A transportation tax is to be worked out on a national basis by a special commission. Customs tariffs are to be increased 10 per cent on luxury items and three per cent on others. The net profits tax is increased from 1 to 1½ cents, a two per cent tax is to be levied on real estate profits, and ¼ of a cent tax must be paid upon all money leaving Cuba either directly or indirectly. An annual appropriation of $5,000,000 is made from the budget and 50 per cent of the treasury surplus goes to the improvement fund.

Most of the taxes are to be in force for 10 years. The transport and gasoline tax however are permanent and the receipts are to be used for highway maintenance. A specific provision of the bill is that only 3 per cent of the fund can be employed for hiring personnel.

Of the 33,000 motor vehicles being operated in Cuba about one-half are in taxicab service. Motor buses number slightly less than 1200 and trucks of all sizes account for about 6500 more so that there are only about 10,000 privately owned passenger cars on the Island. This small number of passenger cars among a population of over 3,000,000 offers tremendous possibilities to the automotive industry.

Cuba already has some fine modern driveways, as the picture above shows. Below is a typical stretch of unimproved road which will be transformed into a magnificent boulevard under the new development program

There is no reason to doubt that construction of good roads in Cuba will have the same results that it has had in the United States and in many other countries.

The luxury tax is the only one in the new bill that is giving American manufacturers any great concern. This provides a 10 per cent levy on all automotive vehicles exceeding $500 in value. It is feared that this tax may tend to curtail sales in immediate prospect. The fact remains, however, that the new roads will bring a demand for automobiles and when the Cubans become accustomed to the somewhat higher prices made necessary by the imposition of these duties the increased sales resistance is expected to wear away. And the American manufacturer, of course, knows that any market which develops is his and that he has little to fear from foreign competition.

Just at the present time the market for automobiles in Cuba is reported as oversupplied—a state which has obtained for several months. The sales of cars has been especially handicapped by the lack of adequate methods of securing payment of installments from time purchasers. By reason of the commercial dullness that has prevailed for several months collections have been slow, and there have been numerous cases of purchases in good faith which could not be completed. But this is a temporary situation and one which is not expected to endure long.

Many American manufacturers already have begun to prepare for the increased business which is sure to materialize. A representative of AUTOMOTIVE INDUSTRIES who visited the Island several weeks ago found a number of American export managers on the scene conferring with their local agents and planning for extensions of dealer organizations to cover the territory in a more intensive manner than heretofore.

Fifth Avenue Coach Co. Designs Low 55-Passenger Double Deck Bus

Overall height only 12 ft. 5 in. Lower deck seats 22, upper deck seats 33. Unique seating arrangement used. Upper deck has top and glass windows.

THE FIFTH AVENUE COACH CO. has built and placed in operation in New York a new bus body seating 55 passengers and with a total overall height of only 12 ft. 5 in. It is designed for use on lines where traffic congestion demands that the amount of street space per passenger be limited and where overhead structures and wire make necessary a comparatively low vehicle.

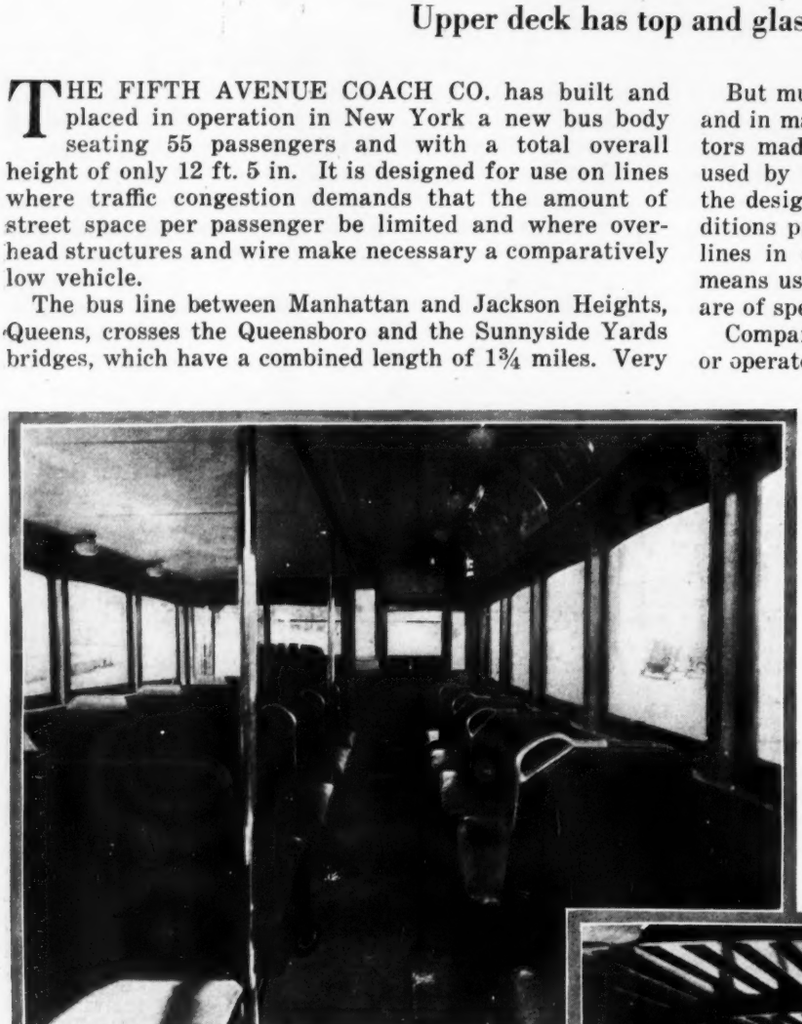
The bus line between Manhattan and Jackson Heights, Queens, crosses the Queensboro and the Sunnyside Yards bridges, which have a combined length of 1¾ miles. Very few passengers are taken on or alight while crossing these bridges so that a major share of the traffic is between terminals. This made necessary a type of bus which had a large seating capacity to care for the heavy demands for service at or near the terminal points. Traffic over the route is very heavy so the use of double deck buses seating twice as many passengers as a single decker seemed to be the solution of the problem.

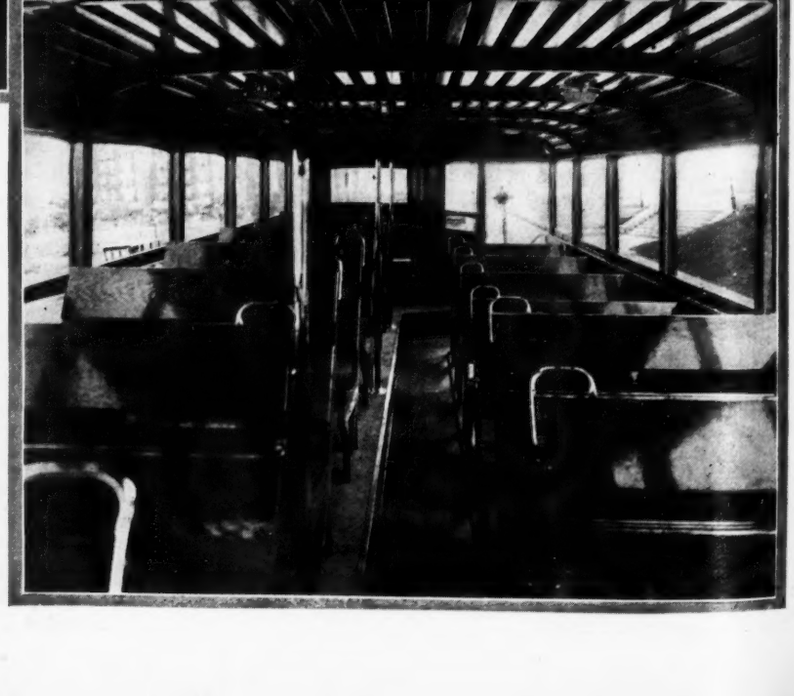
But much of the route runs under an elevated structure and in many places trolley wires are hung low. These factors made it impossible to utilize the double deck buses used by the Coach Company on other lines, and forced the design of a new bus body to meet the particular conditions present. Inasmuch as the operation of many bus lines in other cities involves these same difficulties, the means used by the New York concern to meet the problem are of special interest.

Compared with all other types of double deck buses built or operated by the Coach Company this new model contains a number of changes in design, most of them being in the interior construction of the body. The exterior presents the same appearance as other models except for its decreased overall height.

The passenger body has been placed lower on the chassis so that the chauffeur's compartment is considerably higher than the lower passenger deck. The entrance doorway has been moved slightly to the right and as one enters there is a single row of seats on the right side each of which accommodates one passenger. On the left of the aisle, which is to the right of the center of the bus, is a row of seats accommodating three passengers each. All passengers face forward except two who occupy the front seat on the right side.

The roof over the right hand row of seats





Above (Fig. 1)—Interior view of lower deck looking toward driver, showing location of aisle seating arrangement and depressed ceiling over left-hand seats

At right (Fig. 2)—Interior view of upper deck looking toward rear showing 8 in. platform upon which left-hand seats are placed

has been depressed 10 in. in order to obtain greater headroom for the upper deck aisle. As can be seen from Fig. 1 this in no way interferes with the comfort of seated passengers on the lower deck and provides ample headroom over the aisle for standing or for entering or leaving the bus.

Fig. 3—New 55-passenger bus of 12 ft. 5 in. overall height designed for operation where overhead structures and wires limit headroom.

The upper deck seats each accommodate two passengers except the rear seat which has room for three. The aisle is in the center and while there is not sufficient room for standing erect the height of the ceiling is great enough to cause relatively little inconvenience in moving about. The right hand row of seats are on a platform 8 in. above the aisle and the left hand row, as can be seen in Fig. 2. At the front of the upper deck it has been necessary to elevate the floor over the chauffeur's compartment so that persons walking down the aisle must step up four inches if they wish to occupy the front seats. A marker light indicates the presence of this step. The upper deck seats 33 passengers and the lower deck 22.

Both the upper and lower decks are enclosed with a top and windows, the windows on both decks being of glass and movable to give the advantage of open air riding on pleasant days. Lower deck seats are upholstered in leather while upper deck seats are of wood slat construction. Stanchions and stairway railing are nickel plated and the ceiling of the lower deck is finished with enameled aluminum. In the lower deck roof there are eight 21 candle power dome lights and the upper deck is also well lighted.

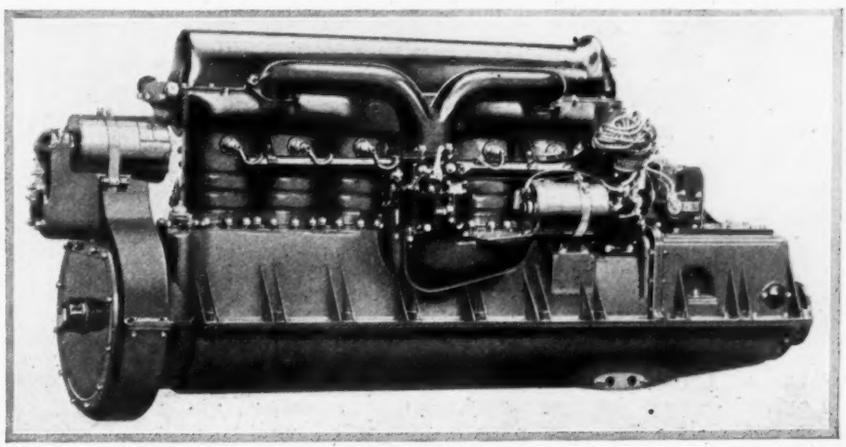
Packard Develops Two New Marine Engines

DEVELOPED from the 12-cylinder model No. 1500 aircraft engine, the Packard Motor Car Company is now producing two types of marine engines. Both power plants are being built so as to conform with the piston displacement limitations of the "Gold Cup" and the "Sweepstake" races which will be held in a few weeks, the former being run in Manhasset Bay, Long Island, N. Y. and the latter in the Detroit River, Detroit, Mich.

Known as the "Gold Cup" model IM-621, the engine has six cylinders as shown in the accompanying illustration and consists primarily of one bank of cylinders taken from the No. 1500 "vee" type aviation engine. In order to come within the required piston displacement, the stroke as compared with the aero engine has been shortened so that it is now less than the diameter of the bore. On the aircraft engine the bore and stroke is 5⅜ in. by 5½ in. while on the marine engine the bore is the same, whereas the stroke is 4 9/16 in. With these dimensions, that latter engine develops 260 hp. at 2500 r.p.m. and weighs approximately 875 lb. complete. In addition to mounting a flywheel at the forward ends which would correspond with the aero-propeller, the crank-case has been extended further back so as to accommodate the clutch and reverse mechanism forming a single unit. Other radical radical changes include watercooling the exhaust manifold and different water pumps.

The "Sweepstake" engine model IM-242 which will be used by Horace Dodge in the races, in addition to two other boats with "Gold Cup" power plants, is a 12-cylinder engine and except for having the same changes as made on the smaller unit, is similar to the big-aero engine. Fitted with high compression pistons the 12-cylinder engine develops 550 hp. at 2500 r.p.m., while with low compression pistons 500 hp. is obtained at a similar number of revolutions.

The six sells for $6,000; the twelve for $12,000.



Packard's new "Gold Cup" marine engine

Efficiency of Internal Combustion Engines Best Measured by Air Consumption

Heat value of fuel supplied may not be true index. Efficiency does not decrease at reduced loads as ratio of compression and expansion is same.

By Harry R. Ricardo*

THE efficiency of the internal combustion engine, unlike that of the steam engine, does not increase with size. It may be of interest to state that though gas engines are built in sizes ranging up to over 50 in. cylinder diameter, yet the highest efficiency so far recorded has actually been obtained with a gas engine of only 4½ in. cylinder diameter.

It is well to keep in mind that in the constant volume type of internal combustion engine, air is the true working medium. Unless the air be fully or almost fully saturated with fuel the latter will not burn with sufficient rapidity while if there be an excess of fuel present it effects the temperature but little, since it is, of course, the amount of oxygen present, rather than of fuel, which controls the temperature. In other words, neither change of mixture strength nor of throttle opening can influence the flame temperature, and, therefore, the efficiency to any appreciable extent.

For a maximum flame temperature of 2500 deg. C. the ideal limiting thermal efficiency of the cycle may be taken as approximately 80 per cent of the air cycle efficiency. On account, however, of the influence of dissociation, which is affected by pressure as well as by temperature, the true ideal efficiency approaches rather more nearly to the air cycle as the compression ratio increases.

Before proceeding further, it will be well to emphasize what is here meant by the much abused term "efficiency." It is customary to reckon the efficiency of any heat engine from the heat value of the fuel supplied, and since it is the fuel alone, and not the air, which is of commercial value, this is, of course, the practical aspect. In the cases of the constant volume internal combustion engine, and more especially when it is using a liquid fuel, a much more accurate determination of the true efficiency can, however, be obtained from the consumption of air, since every pound of air will, by the combination of its oxygen with the fuel, liberate a definite amount of heat, whether it be saturated or super-saturated with fuel.

May Indicate a Waste

This is of more than academic interest for the air consumption of an engine is a true indication of its efficiency as a heat engine, while the fuel consumption may indicate merely a waste of fuel through no fault of the engine.

When the load on an engine is reduced by throttling it can be shown that so long as the mixture is constant, the indicated thermal efficiency remains the same as at full load. The popular belief that the inherent efficiency is less at reduced loads owing to reduced compression is quite incorrect for the ratio both of compression and expansion is unaltered. It should remain independent of load and in practice it does so remain except for a very slight increase in relative heat loss (provided that the mixture is the same and the ignition properly timed). The efficiency reckoned on the brake horsepower will fall as the load is reduced owing to the larger proportion which the mechanical losses bear to the total indicated power.

The efficiency of any internal combustion engine depends upon the expansion ratio employed, the flame temperature, and the loss of heat to the cylinder walls, although this has nothing like the influence generally attributed to it.

Flame Accelerates Outward

When a combustible mixture of fuel and air is ignited, a nucleus of flame builds up with a rapid acceleration outwards from the point of ignition. If its rate of development exceeds a certain critical speed a detonation wave will be set up. This wave will pass through the mixture at a velocity many hundred times the normal speed of acceleration. On striking the cylinder walls the impact of this wave will give rise to a sharp ringing knock and by compressing anew the already burnt products, will still further raise their temperature until they become incandescent and actually ignite the mixture before the completion of the compression stroke.

Until recently it was always considered that detonation occurred only when the mixture was raised to a temperature in excess of its so-called ignition temperature. It is known now that this is by no means necessarily the case and that there is no such thing as a definite self-ignition temperature in the generally accepted sense.

From experimental results Tizard has shown that detonation will be set up when the rate of evolution of

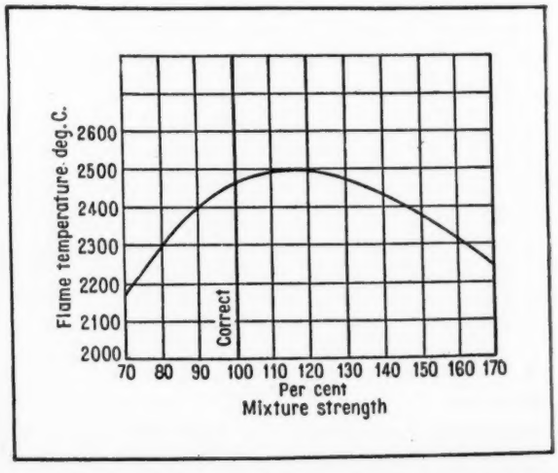


Fig. 1—Relation between mixture strength and flame temperature

*From a series of lectures delivered by Mr. Ricardo at Kings College, London. Abstracted from *The Automobile Engineer.*

heat exceeds the rate at which it can be disposed of to the cylinder walls. Whether the rate of evolution of heat will be sufficient to cause detonation depends upon the chemical composition and the "self ignition temperature" of the fuel, the temperature of the flame, the temperature of the containing walls, the absolute distance the flame has to travel before it passes through the mixture, and the temperature and pressure before ignition.

The highest expansion ratio that can be employed is governed by three factors, viz., the tendency of the fuel

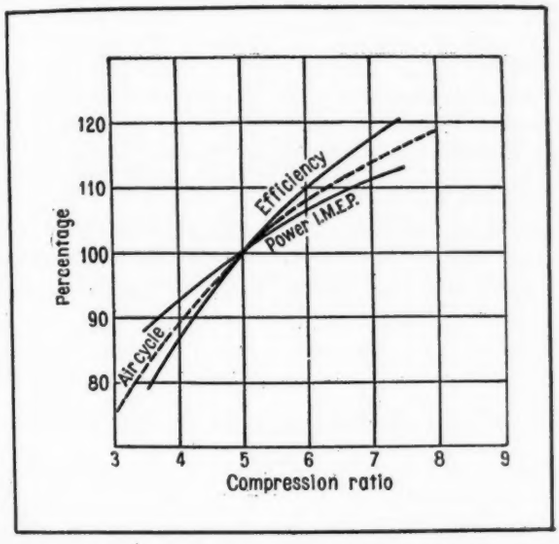


Fig. 2—Variation in efficiency and power of test engine at different compression ratios expressed in percentage of the performance at a ratio of 5 to 1

to detonate, the surface-volume ratio (which must be kept small), and the maximum peak pressure allowable.

When dealing with fuels which detonate readily, such as gasoline, the designer is restricted by the fuel to the use of a compression ratio lower than 6 to 1, and the sale consideration is so to design the compression chamber as to permit the highest possible compression ratio to be used without detonation. To this end the maximum distance from the spark plug to the farthest point in the combustion chamber must be kept as small as possible. At the same time the temperature of the surfaces and particularly those remote from the spark plug must be kept as low as possible.

Detonation depends very largely upon the length of flame travel. It will be apparent that the smaller the cylinder the less the tendency to detonate and the higher the compression ratio that can be used. It is for this reason that most modern racing cars are provided with a large number of small cylinders.

Manner of Burning Important

The next consideration, that the fuel must be burnt as rapidly and completely as possible and at the right time, is an important one. It is fairly obvious that combustion must be completed as soon as possible. It is not expedient to maintain the maximum combustion temperature any longer than can be helped, because the heat loss will be so rapid during this period. It is not desirable, therefore, to work on a true constant volume cycle or to obtain maximum pressure until 10 to 15 deg. after top center.

It is customary to speak only of mechanical efficiency at full load, and this may vary from 80 to 90 per cent. It must be remembered, however, that most high speed internal combustion engines built today are used for road traction where average torque is between 30 and 40 per cent.

Now, an 80 per cent mechanical efficiency on full load becomes only 55 per cent at 30 per cent of full torque, while a 90 per cent mechanical efficiency becomes 73 per cent, so that the difference is not between 80 and 90 per cent but between 55 and 73 per cent, a much more serious matter.

Of the gross mechanical losses piston friction accounts for about 60 per cent of the total. Pumping losses account for about 25 per cent and friction of bearings and auxiliary equipment accounts for about 15 per cent.

When a shaft runs in bearings it may do so under one of three conditions. It may be dry, in which case metallic contact occurs. In that case at high speeds the heat flow due to friction will be excessive, and abrasion will take place. Then there is what is termed boundary friction when the surfaces are coated with a mere smear of oil of little more than molecular thickness. There is little doubt but that in certain parts of an engine—the piston rings for example—a condition of boundary lubrication does exist.

Finally there is the normal condition of flooded lubrication, when the two surfaces are definitely separated by a free oil film. Between boundary and flooded lubrication there is no hard and fast driving line. Flooded conditions may be changed to boundary lubrication as in the case of a journal bearing where the shaft tends to take up such a position as to wedge the oil film in under the loaded side. This applies almost completely when a free floating bush is introduced between the shaft and bearing, since there is than nothing to restrain the bush from taking up such a position at all times and under all conditions.

A well lubricated bearing will fail when the heat generated by friction exceeds the rate of heat dissipation until the temperature rises enough to melt the bearing metal or vaporize the lubricant. The heat generated is the product of the friction and rubbing speed and nearly proportional to the product of load and rubbing speed.

In practice an average connecting-rod big-end bearing can be relied upon to get rid of this heat at a rate to avoid dangerous temperatures. The main bearings of a crankshaft have ample facilities for getting rid of heat by conduction so that they never fail so long as they are lubricated.

In very high speed engines one is faced with the diffi-

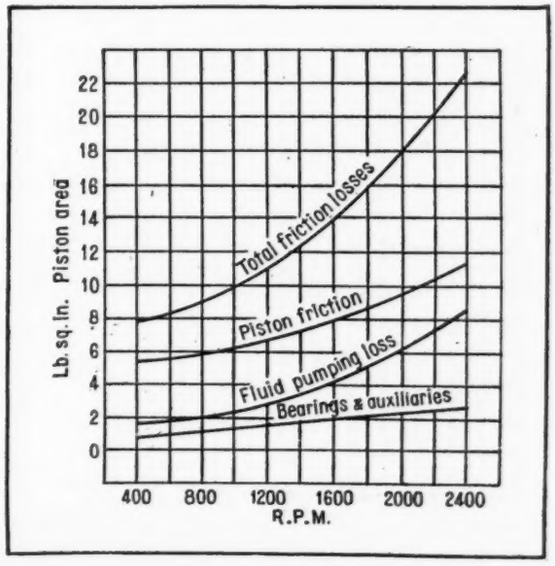


Fig. 3—Friction losses at various speeds and pressures

culty that if enough oil is forced through the big-end bearings to carry away their heat the amount flung out to the cylinder walls will be excessive.

Another aspect is that of wear. So long as any two smooth surfaces are separated by an oil film there can be no actual contact, and wear can be caused only through the medium of minute particles of grit which can span the oil film. The rate of wear depends upon the nature of the surfaces and on the thickness of the oil film which, in turn, depends upon the load factor, so that for any given supply of grit the rate of wear will be directly proportional to the load factor.

In general it is desirable to make one surface as hard as possible and the other as soft as possible short of crushing under load since this combination produces the least tendency to wear.

With regard to mechanical design, rigidity and surface hardness may be taken as the two dominating conditions which govern the life and behavior of an engine.

A crankshaft which is stiff enough to eliminate flexure is more than amply strong no matter of what material it is made, and the choice lies with the best material from the point of view of wear. Similarly, with the crankcase the first essential is rigidity. What is really required are materials for the castings which will flow freely and produce castings free from blow holes and internal stresses.

If the efficiency of the engine is low the exhaust valves will get very hot indeed and it will be necessary to resort to the use of fancy steels such as cobalt chrome or silchrome. If efficiency is high, mild steel or mild steel with a little nickel to give more tensile strength and carbonized to reduce pitting will suffice.

Rough running, periodic vibration and noise are all due to lack of rigidity. What is termed rough running is due almost entirely to momentary bending of the crankshaft under the explosion pressure. It depends upon the rigidity of the crankshaft and its supporting bearings and upon the rate of pressure rise in the cylinders. The rate of pressure rise depends upon turbulence so that too much turbulence will invariably give very rough and noisy running.

I would like to make clear that it is the rate of pressure rise and not the maximum pressure which gives rise to harshness; that is to say, it is a question of turbulence and not of compression ratio.

Drop Forging of Connecting Rods on Quantity Scale

AT a meeting of the Association of German Production Engineers held at Leipsic, Dr. Schweissguth gave a talk on modern production methods in which he made special reference to the drop-forging of connecting rods.

Quantity production, he said, calls for such large numbers of forgings that they cannot be turned out under the hammer in the ordinary way. It is only by the process of forging in dies that the necessary production can be attained. But the production of forgings in dies calls for extensive specialization of equipment and standardization of design.

All machine parts must come from the forging department sufficiently accurate so that only very little stock needs to be removed. The allowance for machining should be so small that the piece can be completely finished by grinding.

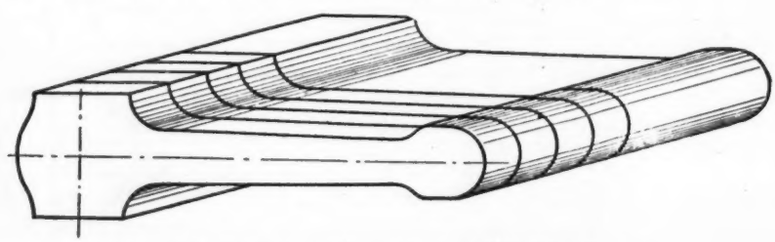
In quantity production we have to do with millions of parts which are produced year after year with the same precision in the same machine. The press or hammer must be suited to the forgings, and the same applies to the furnace. In such a drop forging establishment there is necessarily a large number of groups which turn out forgings independently. A modern forge must be free of smoke, dust and floating ashes, hence the furnaces must be heated with either oil or gas.

All forging is done in dies, and in order to save the dies and prevent undue heating of same, only a single blow of the hammer or one stroke of the press should be used with the piece in any one die. The shape of the dies used successively should gradually approach the form and dimensions of the finished forging. Dies are made by means of automatic die sinking machines or copying machines. With these the die is milled, but not from the full block, the approximate form of the die being pressed into the block while at red heat. Dies produced in this way are appreciably more durable than those machined out of the solid block.

Wherever possible the rolling mill should take into consideration the form of the blanks required, the steel blocks or billets being rolled to the profile of the blanks, and individual blanks sawed off. This is illustrated by the example of an automobile engine connecting rod of which drawings are reproduced herewith.

For raising the blanks to the forging temperature, use can be made to advantage of a vertical rotary oven which can be operated at very high temperatures. It should have from six to ten doors on the circumference and preferably be power operated. High thermal efficiency is of less importance than the highest possible heating capacity.

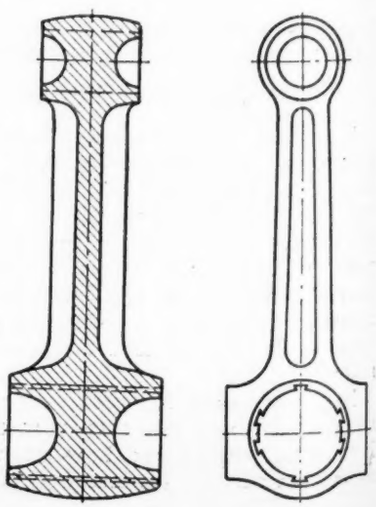
Forgings of very complicated form can be made by first forging parts separately and then welding them together by the fuse welding process.



Billet rolled to profile, for the quantity production of connecting rod forging blanks

Left — Connecting rod forging forged by the old process

Right — Connecting rod forging forged by the new process



Just Among Ourselves

Export Markets Get Bigger and Better

JOHN N. WILLYS predicted the other day that American and Canadian exports and foreign assemblies would reach 500,000 this year. That's a bit higher than we expected but no higher than we hoped. It begins to look as though the half-million mark may be reached, however, as stories of new export records continue to come through with pleasing regularity. Last week Hupmobile announced that export sales this year have been 100 per cent greater than last, while Studebaker reports a 60 per cent increase for the last nine months. Grand totals from Government figures bear out the optimistic tone of these individual statements. The 1,000,000 a year exports which Mr. Reeves has been looking forward to for some time bid fair to be with us before we know it.

Too Much Can Be Given Away

Here's a little story of automobile merchandising that we think is worth repeating. Hare and Chase, Inc., published it in a bulletin last week and vouched for its being true. A prospective car buyer tells the incident:

"I lately decided to buy a certain well known make of car with a time price of some $660. I went in merely to look over the line. A salesman pounced on me and practically invited me to drive one home.

" 'But' I said, 'I haven't the full down payment ready at the moment. Your appraiser values my old car at $125 and I need nearly a hundred dollars more to make up a third.'

" 'You don't need a third' he gushed. 'We sell them for 15 per cent down. Your car is down payment enough and to spare.'

" 'That would make the notes too high,' said I. 'I can handle it better with a full third paid down.'

" 'We'll make the notes all right. We'll give you eighteen months.'

"Luckily I was between him and the door so he couldn't lock me in or I'm convinced he would have. I escaped and that closes the incident. People so hard up as all that to sell cars can't unload them on me. I don't know yet what car I'll buy but it won't be one they have to *give away*."

Carried to extremes any good idea is bad.

Production Costs Still Coming Down

"THE strides that are being made in automotive production work today are little short of remarkable," a manufacturing executive told us last week when we got to talking about current price reductions and their relation to cost. The reductions are covered partly by lower production costs, this man believes, but partly also by competitive hopes and fears. He went on to say, however, that the idea that the automotive industry has reached the ultimate in production economies and manufacturing methods is all wrong. His opinion is particularly valuable because his work brings him into intimate association with practices in a multitude of important plants so that his observations are widespread.

"The ultimate in production is a lot like the saturation point for motor cars. Ten years ago I heard it said that the automotive industry had reached a point where production methods couldn't be improved much. Today the methods of ten years ago would be a joke. The work that is going on now in pressed metal and stamping work, in forging processes, in castings materials and processes is almost certain to bring further important reductions in the cost of building automobiles. True, most of the changes today are specific rather than general in character; they pertain to a particular type of work or to a small unit of production. But put together these factors make a total of real importance. On one of the lower priced cars this year, for example, stampings have replaced castings to a major extent, only a few of the latter being left on the job. And this change has meant considerable cost reduction in view of the quantities in which this particular model is built. So far as automotive production is concerned 'the end is not yet.' "

All of which goes to show again that the man who always is saying that evolution has stopped almost invariably is wrong.

Emotionally Logical or Logically Emotional

Most engineers have been trained to think logically. They can convince themselves of the truth of most things only by reasoning logically step by step from the known to the unknown. Particularly is this true as regards a thorough-going, well-trained engineer. And this very quality is what often makes it difficult for the better technical men to get their ideas across to other executives or to larger groups of people. Because the engineer thinks logically himself, he tends to believe that other people think logically also. Of course, they don't; except for a very small proportion. Most people are guided by impulse or emotion to a large extent, whether they admit it or not. But the engineer too often refuses to recognize that fact. "People ought to think logically," he argues, "therefore I'll urge them in a logical manner." Which is just one of the exceptions to the practice of thinking logically on the part of the engineer.

N. G. S.

Philippines Capable of Producing 16% of World's Rubber

Could supply approximately one-fifth of total U. S. consumption, or 70,000 tons yearly, according to Government survey. 1,500,000 acres for planting on three islands.

ON the basis of this new Government survey, the Philippine Islands may some day become one of the world's chief sources of rubber supply.

The experts who made the study report that conditions in the Philippines are favorable for the production of 70,000 tons of good grade Para rubber annually. If such a development were realized the Pacific possessions would become the third greatest rubber producing territory in the world.

At present the chief producing area is Malaya, which in 1924 yielded 165,000 tons. Next came the Dutch East Indies with 162,000 tons. Ceylon contributed 37,000 tons and Brazil 23,500 tons. The remainder of the supply came from British India, British Borneo, Indo-China, Sarawak and smaller scattered centers.

Total world production in 1924 was 420,000 tons. Of this amount, 80 per cent was consumed by the United States.

THE Philippine Islands, properly developed, are capable of producing one-fifth of the total amount of crude rubber consumed in the United States at the present time.

Studying the possibilities for Para rubber production in the Pacific possessions, U. S. Government authorities find that there is a total area of approximately 1,500,000 acres on the three islands of Mindanao, Basilan and Jolo which is suitable for rubber growing.

It is estimated that this acreage, fully planted and mature, would produce 70,000 tons of good-grade Para rubber yearly.

With the crude rubber requirements of the United States mounting each year, and with Great Britain exercising a close control over the present world supply, the possibilities of developing an additional 70,000 tons annually, presumably, at least, for their own exclusive needs, will no doubt appeal to American rubber manufacturers, as well as to those interested in any phase of the automobile industry.

An additional available supply of 70,000 tons of crude yearly, if the supply were controlled by American interests, would probably have some effect on world prices. It might conceivably serve as a counterbalance against the present method of price setting, which is determined almost wholly by the operation of the British restriction act. The recent heavy increases in the market price for crude rubber, which were so severely felt on this side, might have been considerably moderated if the United States had controlled a big tonnage of its own to throw into competition with the British-grown product.

Seventy thousand tons will by no means fill the total rubber requirements of our country, yet it is an amount equal to 19.5 per cent of present consumption, which is rated by competent estimators as 360,000 tons for 1925. It is 16.7 per cent of the total world production of 420,000 tons in 1924.

American-Controlled Supply

Prominent rubber manufacturers and automobile men in the United States have been strenuous during the last few years in their advocacy of an American-controlled rubber acreage and the report of the Government's Philippine survey therefore is of more than passing interest. It has just been issued under the direction of Julius Klein, director of the Bureau of Foreign and Domestic Commerce. The work of preparation was carried out under H. N. Whitford, chief, Crude Rubber Section, Rubber Division of the Department of Commerce, and the studies upon which it is based were conducted by C. F. Vance, special agent; A. H. Muzzall, special agent, and J. P. Bushnell, assistant trade commissioner.

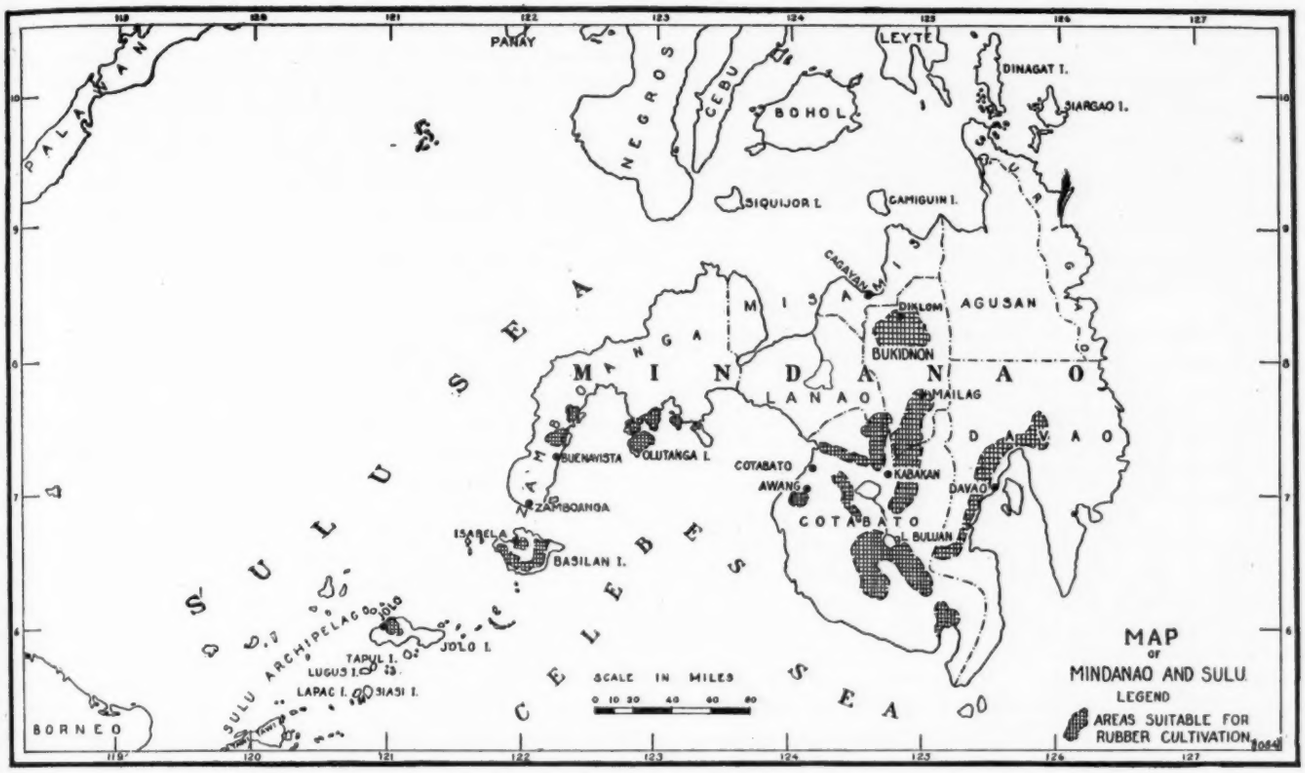
There is also appended to the report a special section on soil characteristics by Mark Baldwin, inspector, of the Department of Agriculture.

The findings of the report, summarized, indicate that the climatic conditions of the Philippines are as favorable for rubber planting as are those of the Middle East. As regards soil, topography and accessibility, there are large areas, that, if utilized for rubber production, would be not only equal but superior to the land now generally available for new plantations in Sumatra and Malaya, the principal rubber producing districts of the world at the present time.

Compared to Middle East

The report throughout contrasts conditions in the Philippines with those in the rubber growing areas of the Middle East, as any rubber produced in the Philippines must necessarily come into competition with that coming from the latter source.

The specific areas suitable for plantation development are on the islands comprising what is known as the south-



The specific areas suitable for rubber plantation development on the islands of Mindanao, Basilan and Jolo, comprising the southern group of the Philippines. The areas as a whole represent a total of about 1,500,000 *acres*

ern group of the Philippines. Much of this land is within easy reach of water transportation; some needs access roads, as is usually found to be the case of any development tending to open up new territory of this kind.

Some rubber is already grown in the islands and the investigation shows that, as regards growth of trees and yield of latex, the few existing plantations compare favorably with some of the best in the Middle East area.

A few species of rubber or gum producing plants are indigenous to the Philippine Islands, but no early records of any extraction for commercial purposes have been found. No attempt was made whatever to develop rubber planting as an industry prior to American occupation. The first step in this direction of which there is any definite record occurred in 1906 when a planting of Ceara rubber was made by one F. T. Winters. Extraction, however, proved unprofitable.

The Basilan Plantation Co.

In the intervening years further attempts have been made and some of these have met with considerable success. A conspicuous example is the Basilan Rubber Plantation Co., which has developed large plantations on the island of Basilan. The first commercial tapping was made by this company in 1915, when 14,650 trees were tapped, yielding 12,932 pounds of rubber. In 1916, with additional trees reaching maturity, 32,982 pounds were produced. The plantation in 1917 numbered 72,000 Para trees. At the present time the estate consists of 795 acres, with 89,500 trees.

Most of the rubber planted in the Philippines has been on virgin jungle land; but small areas of cogon land were planted on the Rio Grande Co.'s Kabakan estate and on the property of the American Rubber Co. with very favorable results. Tapping, collection and coagulation methods are practically the same in the Philippines as in the Middle East.

Three of the existing Philippine plantations are located on Basilan Island. Kabakan estate is in Cotabato Province. There are a few trees planted on Lumayan estate on the Zamboanga Peninsula. Because these properties represent virtually the only practical experience in rubber-plantation development in the islands, considerable detail is given regarding the special characteristics of each and the methods in use.

The ownership, nationality, capital invested, acreage, and total number of trees on four of the existing plantations are set out below:

COMMERCIAL RUBBER PLANTATIONS, PHILIPPINE ISLANDS

Name of Company	Nationality	Acreage in Rubber	Number of Trees Planted
American Rubber Co.	American	1,625	175,000
Basilan Rubber Plantation Co.	Swiss	795	89,500
Rio Grande Rubber Co.	Scottish-American	360	29,750
Zamboanga Development Co. (Balactasan estate)	Japanese	110	10,000
Total		2,890	304,250

Girth measurements of trees on representative plots in the different plantations are shown as follows:

GIRTH MEASUREMENTS OF RUBBER TREES ON PHILIPPINE PLANTATIONS

Age of Trees	American	Basilan	Rio Grande	Age of Trees	Basilan	Rio Grande	Zamboanga
	Inches	Inches	Inches		Inches	Inches	Inches
4 years	9	16	15	8 years	34	....	....
5 years	14	21	....	9 years	36	....	29
6 years	....	26	22	10 years	39	37	36
7 years	....	30	....	11 years	41	....	....

Yields on Three Properties

The following table brings together such data as are available concerning the yields on three of these plantations.

AVERAGE YIELDS ON PHILIPPINE RUBBER PLANTATIONS

Plantation	Area in Tapping	Trees per Acre	Average Age of Trees	Yield per Tree per Day	Yield per Acre per Year	Tapping System
	Acres	Number	Years	Grams	Pounds	
American.....	10	108	5	4.6	[1]110	1 cut on one-half, alternate day.
Basilan.....	400	105	8	6.2	[2]235	1 cut on one-third, alternate day.
Zamboanga...	110	120	9.5	5.4	[3]480	1 cut on one-third, daily.
		71		8.1	[3]426	2 cuts on one-third, daily.

[1]Based on 2 months' tapping, November and December, 1923.
[2]Based on 6 months' tapping, July to December, 1923.
[3]Based on 10 months' tapping, 1923.

At the time of the investigation only two small plots on the American Co.'s plantation were being tapped. The trees were a little over five years old. No figures of total production were available.

On the Basilan plantation the tapping was rather erratic until July, 1923, and the production figures cover only the months of July to December, inclusive. The total yield for these six months was 47,076 pounds of dry rubber. There were 22,000 trees tapped every day; but since the tapping was alternate daily, double the number of trees were actually tapped during this period.

Earlier production figures on the Basilan plantation are: 1915, 12,932 pounds; 1916, 32,982 pounds; 1917, 62,115 pounds; 1918, 105,000 pounds; 1919, 135,982 pounds; 1920, 142,326 pounds; 1921 and 1922 no tapping operations.

Tappings on Daily System

The rubber on the Zamboanga Development Co.'s property was being tapped on a daily system, so the annual yields per acre were naturally higher than on the Basilan plantation where they tapped alternate daily. The plantation is now leased and operated by the American Rubber Co., and no figures of output under the previous Japanese management are available. Production in 1923 totaled 40,000 pounds. The Kabakan plantation of the Rio Grande Rubber Estates has not yet been brought into tapping.

The following table shows crude rubber exports from the Philippine Islands for the past several years.

EXPORTS OF RUBBER FROM PHILIPPINE ISLANDS, 1914-1923

Years	Total Exports	To United States	Years	Total Exports	To United States
	Pounds	Pounds		Pounds	Pounds
1914	3,422	2,811	1919	191,366	189,891
1915	72,754	72,754	1920	132,197	126,174
1916	29,224	28,717	1921	89,566	49,229
1917	65,761	64,548	1922	.....	.....
1918	76,026	75,111	1923	86,087	5,291

These figures include plantation rubber, some wild rubber, and probably some plantation rubber from the Middle East sent to the Philippines for reshipment to the United States. Most of the plantation rubber produced locally is now shipped to Singapore for auction on the open market.

It will be seen from the above table that the peak of exports was reached in 1919 and that the total rubber coming from the islands that year was only slightly in excess of 95 tons.

The report deals with the practical side of rubber planting in a comprehensive manner, making the study doubly valuable to anyone seriously interested in the situation. Operating costs and investment have been carefully considered.

The capital cost of bringing European-owned rubber plantations into bearing in the Middle East varies greatly, with an average around $250 per acre. Opening costs of rubber planted on forest soils, including clean clearing, full equipment of buildings, roads, etc., will average $300 per acre. The costs are less when grass or second-growth lands are opened. Further economies are possible through the employment of less intensive methods and more modest equipment. Location as regards transportation facilities and the topography of the country also affect costs. Some of the European-owned plantations in the Middle East grow coffee and tea in connection with rubber—coffee in Java and to a less extent in Sumatra, and tea in Ceylon.

No complete book figures are available for the actual capital cost of bringing rubber into bearing on the few small plantations in the Philippines; incomplete figures and the methods used indicate that it is somewhere between $100 and $200 per acre. For forest lands clean clearing has not been practiced. Catch crops have been raised on part of the area planted; such crops, together with the grazing of cattle among the rubber, have aided materially in reducing upkeep expenses. A gauge of the low opening costs on grass-lands that might be attained can be found in the $25-per-acre contracts that have been made for planting cocoanuts. Favorable physical conditions in the Philippines indicate that, if the generally accepted standard methods of the Middle East are used, even with higher labor costs the capital cost of opening in the former region might be kept on a competitive basis with those regions now available for new rubber plantings in Sumatra and Malaya.

Land laws in Sumatra allow leases of practically unlimited area for 75 years, subject to renewal for 50 years more. Land leases in Malaya are perpetual and are unlimited as to area.

Under the present land laws of the Philippines a corporation can purchase 1024 hectares (2530 acres), or a corporation or an individual can lease 1024 hectares for 25 years subject to renewal for two additional periods of 25 years each. While the law does not specifically state that a corporation can purchase one plot of 1024 hectares and lease another of the same size, it is possible that the law would be interpreted favorably in this regard, in which event the limit to the amount of land under the control of a corporation would be 5060 instead of 2530 acres.

The maximum limit of area is too low for corporations wishing to undertake plantation projects on a large scale but would not in itself deter individuals or corporations that have less ambitious plans. The maximum term of lease, limited as it is by the present law to 75 years, might prevent capital from selecting this region in preference to others. However, the Philippine Legislature has power to make grants of lands with more favorable terms, subject to the approval of the President of the United States.

Taxation is dependent on the financial condition of a country. In the Philippine Islands, during the decade 1914 to 1923 expenditure exceeded revenue only twice, and imports exceeded exports only twice. The bonded debt is given as $77,000,000, about $6.50 per capita, compared with nearly $10 in Netherlands India. Generally speaking, the Philippines are in a better financial position than Netherlands India and compare favorably with Malaya and Cochin China. Most Eastern countries will experience a gradual readjustment of their budgets owing to decreasing revenue from opium, and new taxes will be levied in other channels; this problem is not present in the Philippines.

There are no export duties at the present time on plantation rubber in the Philippines, Netherlands East Indies or Indo-China. Export duties are levied in all the British possessions in the Middle East, where also measures of temporary duration restricting the exportation of rubber are in force. The Philippines and producing regions other than the British possessions have no such restrictions.

Nichrome Alloy Successfully Used to Strengthen Castings

Brinnell hardness is increased 20 points. Greater transverse and tensile strength. More resistant to abrasion. No increase in difficulty of machining.

SINCE 1912 the cost of repairs required by Mack trucks has been reduced over 75 per cent. William Day, Jr., metallurgist of the International Motor Co. states that much of the credit for this is due to the use of nickel alloy steel for such parts as jack shaft, axles, frame, steering knuckle, etc. Similar results are expected from the use of nickel-chromium alloy iron for cylinders, pistons and other castings.

As a result of extensive research work in the laboratories of the International Motor Co., maker of Mack trucks, in an attempt to find a method of alloying iron to make stronger castings for cylinder blocks, pistons, differential housings and similar parts where increased strength, hardness and resistance to abrasion are important, it has been found that about two per cent of Nichrome, a patented alloy manufactured by Driver-Harris Co., added to the ladle of molten iron produces castings which have these desirable characteristics, but are no more difficult to machine than ordinary castings.

For some time automotive engineers have been seeking some way of producing stronger castings for use in automobiles. Because of the irregularity of the castings, the numerous cores required and the necessity for absolutely sound castings, gray iron with a high silicon content has been the best available.

Many attempts have been made to alloy this metal in such a way that the strength and hardness would be increased, but considerable difficulty has been experienced in obtaining uniform results. Nickel has been added successfully either in the cupola or in the ladle of molten metal and has made an improvement in the castings. Silicon, however, which is present in relatively large quantities in most automotive castings, cooperates with the nickel in forming large flakes of graphite which produces an extremely soft product.

To offset the effect of these elements chromium has been added to the mixture. The addition of chromium does break down the granular structure and improve the castings to a considerable degree, but it was found almost impossible to get any uniformity of results in castings made. When chromium is added in the cupola, under the splendid oxydizing conditions present, a considerable portion of the metal oxydizes so that it is always uncertain just what the chromium content of the poured mix will be. When metallic chromium is added to the ladle it is immediately oxidyzed at the surface of the melt, thus making it impossible, or at least extremely difficult, for the molten iron to attack it.

The addition of other alloying substances was tried, but none seemed to offer the same possibilities as nickel and chromium, so further attempts were made to discover some method by which they could be added to the iron in such a way that the content of the alloys in the castings could be foretold with accuracy.

This search led to the trial of Nichrome. Nichrome has the following approximate analysis:

Nickel 60 per cent
Chromium 12 per cent
Iron 24 per cent

with small quantities of carbon, manganese and other elements.

Varying quantities of this alloy were added in the ladle with very satisfactory results. The practice was to add metallic Nichrome to a hot empty ladle and then fill it with molten iron from the cupola spout. It was found that the Nichrome melted almost instantly and all its ingredients entered the solution and that the stirring effect of the pouring process effectually mixed the mass so that the alloy was evenly distributed throughout the ladle.

Two per cent of Nichrome by weight added to the iron produced castings which were considerably harder than ordinary gray iron, were more even in texture, had increased tensile and transverse strength, were much more resistant to abrasion, but could be machined with the same feeds and speeds as were used for ordinary castings.

The extent to which the addition of Nichrome influences the hardness of castings is shown in the following table, which gives Brinnell index figures for three castings without Nichrome and with varying proportions of that substance:

Amount of Nichrome added	Brinnell hardness
None	207-217
1 per cent	212-228
2 per cent	223-235
3 per cent	241-255

A typical analysis of an iron casting to which Nichrome has been added is given:

Carbon	3.14 per cent
Manganese	0.55 per cent
Silicon	2.07 per cent
Chromium	0.42 per cent
Nickel	1.57 per cent
Copper	0.10 per cent

From the microphotographs accompanying this article the effect of the addition of Nichrome on the granular structure of castings is plainly seen. Grains are much smaller and graphite flakes are finer and more widely dispersed. This fact probably is one explanation of why it is possible to machine alloyed castings

of 230 Brinell hardness with no more difficulty than ordinary gray iron of 170 Brinnell. The fine grain structure is also evidenced in the smoothness of machine cuts. It is particularly noticeable in threading operations that the threads cut in the alloy castings are almost entirely free from the jaggedness present in usual casting threads.

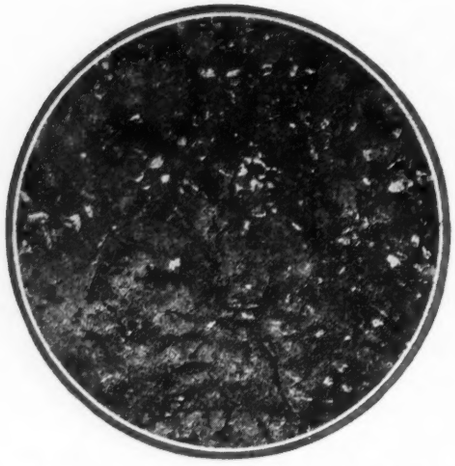


Fig. 1—Microphotograph (100 diameters) of ordinary gray iron casting

Fig. 2—Microphotograph (100 diameters) of iron casting with 2 per cent of Nichrome added

The fact that alloy castings are much more resistant to wear is due of course partly to the increased hardness, but W. E. Day, chief metallurgist of the International Motor Co., who furnished much of the information presented here, believes also that the fine grain and more highly dispersed graphite particles made possible by the addition of nickel plays no small part in producing this desirable result.

Another advantage these alloy castings have is that there is no appreciable difference in hardness or grain structure throughout the casting. The bottom of the casting, cored surfaces, and corners all have the same consistency as the outside. A cylinder casting cut in half and tested at half inch intervals showed practically no variation in Brinnell hardness.

Nichrome is furnished in bars, notched so that proper weights for adding to the ladles may be obtained readily. it costs about 50 cents per pound, so that when 2 per cent of the alloy is added to castings the cost of the latter will be increased about 1 cent per pound. A patent to cover this new application of Nichrome, which was originally designed as a material for resistance wire in electric heating devices, has been applied for.

How Ford Tests Trimming Cloths

AMONG the tests applied by the Ford Motor Co. to material for trimming closed cars is the rubbing test, in which two cushions are rubbed together by an automatic machine. A standard cushion is taken from stock and is placed in an electrically controlled device against a cushion trimmed with the cloth to be tested. Pulling of a switch sets the testing machine in motion, a rubbing stroke of 2½ in. being used. Except for occasional inspections, this rubbing process is continued until one or the other of the cushions wears out. It is stated that standard Ford cloth usually stands up for 140 hours before it gives way under this test. If the cloth subjected to the test stands up as long as or longer than this, it is subjected to other tests bearing on its tensile strength, density of weave, weight and distribution of its wool and cotton content.

All cloths used by Ford have what is known as an up and down weave, there being as many threads in the warp as in the woof, hence the tensile strength in both directions should be the same. To prove this, 1-in. strips of the material, cut in both directions, are placed in a tensile test machine, and a dial indicator registers the tension sustained at the breaking point.

When it leaves the looms the cloth is 72 in. wide but, by shrinking, it is brought down to 56 in., and a yard of the finished cloth must weigh not less than 18 oz. A certain percentage of wool is required, and to determine whether the cloth contains this percentage a sample is sent to the chemical laboratory where it is subjected to the action of a solution which dissolves the wool but does not affect the cotton. Inspection of the remaining piece of cotton cloth then shows whether the distribution of the wool was uniform or not.

MANY investigations relating to the detection of flaws in steel by magnetic analysis have been made at the Bureau of Standards and elsewhere, but the uncertainty in the interpretation of results has hitherto been an obstacle in the way of practical application.

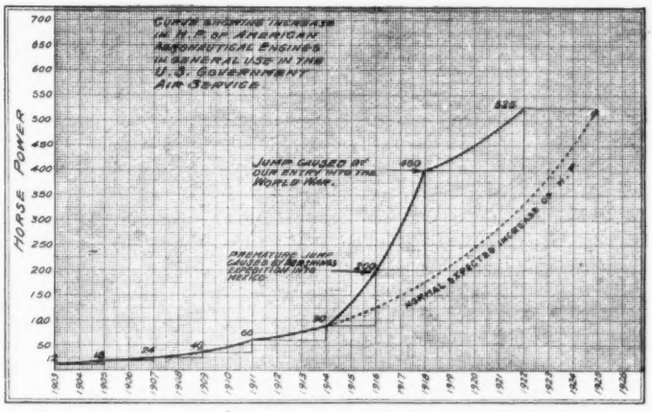
Experiments have been made recently at the bureau to discover the cause of this uncertainty, and a method of eliminating it. It has been found that the greatest source of difficulty is the effect of variations in internal stress within the specimen. Such variations give rise to large differences in magnetic permeability, which produce effects similar to and often greater in magnitude than those caused by the flaws in the material. The results of recent experiments show that by the use of higher values of magnetizing force than have been employed heretofore, the effect of internal stress is greatly reduced without a corresponding reduction in the effect of flaws. It thus appears that one of the greatest difficulties in the way of the practical application of this method has now been overcome. The experiments are being continued to determine whether or not sufficiently accurate interpretation of the results of magnetic exploration can be made to permit of its use as a practical inspection method.

Wars Have Forced Major Developments in U. S. Airplane Engine Design

Use of more powerful motors has always been contingent on ability to construct planes capable of utilizing them. The 400 hp. Liberty still standard. Commercial influence coming.

By H. H. Arnold

THE well-known principle of supply always meeting the demand can be no better illustrated than by the regular increase of the horsepower of airplane engines following the requirements of the designers of airplanes. From the inception of the first airplane, one type after another has been produced to fill the higher standards and requirements of the United States Government.



How airplane engines in general use in the United States Government Air Service have increased in horsepower

In order to improve the performance, more efficient and higher powered engines must have necessarily been selected before these planes were actually constructed. In some cases, existing types of engines were used in new planes but, in most cases, a maximum performance had been obtained from the planes before something better was desired or the new type was produced and an increase of horsepower would, accordingly, have affected very little improvement in performance.

In this article, only those engines are considered which were adopted as standard by the United States Government for, in the final analysis, between the years from 1909 to the end of the World War, there was very little demand for airplanes for commercial enterprises or for use by individuals. It might very well be said, then, that the United States Government, even though its requirements were small, dictated to the manufacturers the characteristics of both airplanes and engines.

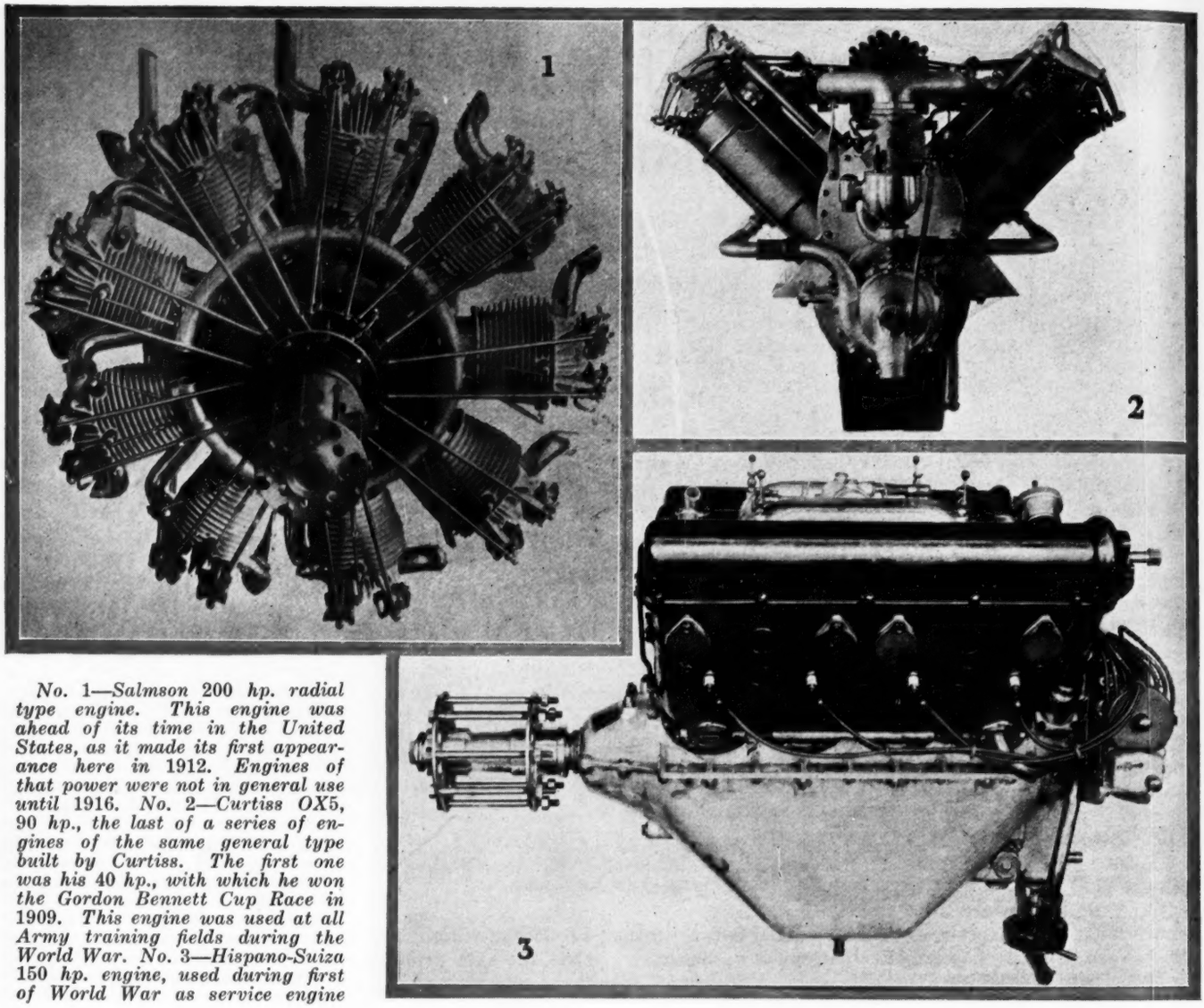
Prior to Dec. 17, 1903, when the Wright Brothers made their first flight in a power-driven heavier-than-air plane, there were no suitable light weight gasoline engines available for their purpose in the United States. Langley was impressed with the same condition so that he also built the engine that was used in his experiments. The Wrights made a very thorough search for a suitable engine but finally came to the conclusion that, in order to get what they wanted, they would have to build an engine themselves. This was quite an undertaking for, at that time, the science of gasoline engine design and construction was very primitive, had no experience on which to base its conclusions, and was just emerging from the status of complete mystery.

All gasoline engines of that day were notoriously unreliable and the requirements for engines in airplanes were reliability, low weight per horsepower, and simplicity in construction. It was but natural that the Wrights' first engine was very crude. It was a four-cylinder type, developed only about 12 horsepower, and used a gasoline spray in the intake manifold in place of a carbureter. It is to be noted, however, that in order to secure a maximum efficiency from that engine, the Wrigths' used two large chain driven propellers which rotated comparatively slowly. In order that the two propellers would rotate in opposite directions, one of the chains was made to cross over itself. The crossing of a chain was admitted by the engineers of that day to be against the generally accepted practice and was an unsound engineering principle. However, the Wrights crossed that chain and, strange as it may seem, there are very few instances on record of chains on the Wright plane breaking in the air.

As time went on, this engine was refined and improved until by 1909 it was delivering in the neighborhood of 20 to 24 horsepower. This power was sufficient for the needs of the plane they had produced and a further increase in power did not materially better the performance of that plane. The type of the plane itself did not change materially during the following years and various aviators tried to better the performance of the old Wright type "B" by installing an engine with greater horsepower. The benefits derived were only negligible. The speed of the plane with its original engine was about 43 miles per hour and the added 20 to 30 horsepower merely increased that speed to about 50 miles per hour, which was still slightly less than the other type planes produced during the same period.

It is interesting to note that the record for weight carrying for the Wright type "B" is still held by Parmalee in a standard equipped Wright plane. The engine produced less than 30 horsepower and yet he carried up in flight a total weight of about 900 pounds. Certainly a remarkable feat for such a low powered plane.

When Glenn Curtiss started his aeronautical work, he



No. 1—Salmson 200 hp. radial type engine. This engine was ahead of its time in the United States, as it made its first appearance here in 1912. Engines of that power were not in general use until 1916. No. 2—Curtiss OX5, 90 hp., the last of a series of engines of the same general type built by Curtiss. The first one was his 40 hp., with which he won the Gordon Bennett Cup Race in 1909. This engine was used at all Army training fields during the World War. No. 3—Hispano-Suiza 150 hp. engine, used during first of World War as service engine

also endeavored to locate a suitable gasoline engine but, finally, as did the Wrights, solved the problem by adapting his motor-cycle engines to the airplane. As his work progressed, he found that he was not getting the maximum performance from his planes and, accordingly, increased the power of his engine until, in 1909, when he won the first Gordon Bennett Race in France, he used a plane equipped with an engine of about 40 horsepower. Again he was not securing the best performance possible from that plane, as was indicated by the fact that the installation of a 60 horsepower engine in practically the same plane in 1911 gave him greater speed and increased the ceiling and weight carrying ability of the airplane.

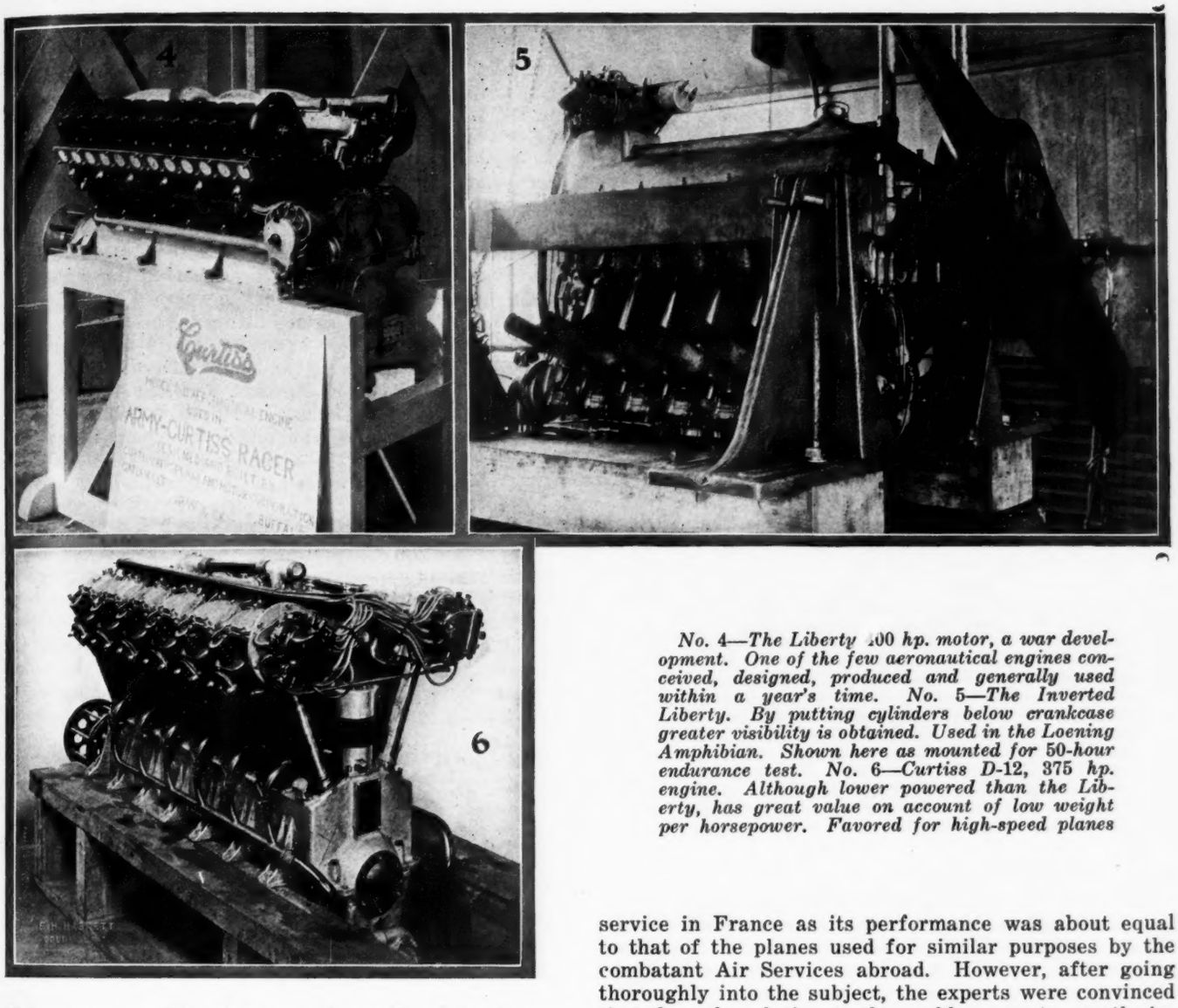
During the period 1909 to 1914, several attempts were made to produce and use higher powered engines. Some of these engines proved successful but the absence of planes suited for their installation became very apparent. In 1910, the Wrights produced an eight-cylinder engine that delivered in the neighborhood of 80 horsepower. This engine was installed in a miniature of the Wright type "B." The term "miniature" is used because the plane was of the same general form as the type "B" but had much smaller dimensions. There is no doubt that if this engine had functioned properly, the world's speed record for the year 1910 would have been 20 miles an hour greater than it was. Unfortunately, several of the cylinders cut out during its first trial at Belmont Park and no further tests were made of it.

During the same period, the 200 hp. Salmson, 16 hp. Gnome, 100 hp. Renault, and the 110 hp. Austro-Daimler were brought over to this country—some installed in foreign planes and some installed in American-built planes.

Engine Design Ahead of Planes

The United States Government in its quest for planes for better performances even went so far as to specify to American designers and constructors that certain of these foreign engines should be installed in planes being built to conform to Government specifications. In all of these attempts, however, the results did not justify the adoption of that great an increase of horsepower. Looking backward at the aeronautical engineering of that date, it now is apparent that the engine designers of Europe were far ahead of the American plane designers, for it was not until, in some cases, as much as four years later, that the time arrived when the American airplane designers could efficiently use 200 horsepower.

The planes up to this period had been of the pusher type, but in 1914 Curtiss produced his first tractor, the JN type, and equipped it with an engine delivering about



No. 4—The Liberty 400 hp. motor, a war development. One of the few aeronautical engines conceived, designed, produced and generally used within a year's time. No. 5—The Inverted Liberty. By putting cylinders below crankcase greater visibility is obtained. Used in the Loening Amphibian. Shown here as mounted for 50-hour endurance test. No. 6—Curtiss D-12, 375 hp. engine. Although lower powered than the Liberty, has great value on account of low weight per horsepower. Favored for high-speed planes

90 horsepower. The plane met the needs of the Government until the Expeditionary Forces were sent into Mexico and the JN planes were tried out in that service. Several almost disastrous accidents demonstrated that the JN's could not attain the very high altitude that was required to cross the mountain ranges. Airplanes with a greatly increased performance were immediately demanded by the United States in order that the Expeditionary force would be equipped with all its component arms. Fortunately, a plane better suited for that work was under way and it was possible to furnish them with a new type equipped with a 200 horsepower engine. Again it is to be noted that the increase of power to the old JN did not materially increase its performance. The speed of the original JN was in the neighborhood of 70 miles per hour and, as we found out later, by installing a 150 horsepower engine, thus doubling the original power, the speed was raised only about 15 miles per hour. The, then, new type of plane with its 200 horsepower engine was standard for service use from 1916 until we entered the World War.

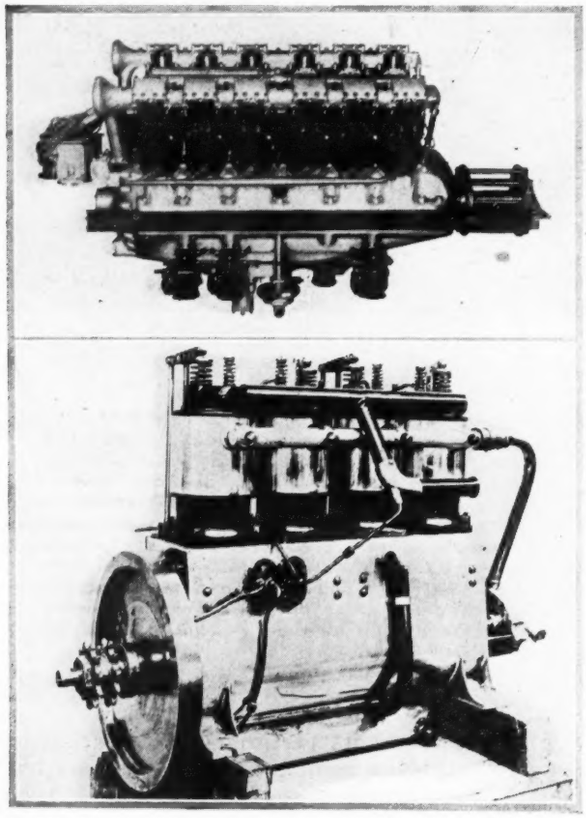
The experts, who were called to Washington to formulate a plan and policy for Air Service equipment production, believed that the airplane engine problem would be solved by producing a standard type engine of about 200 horsepower that could be rapidly produced in quantities at small cost. It was thought that the plane then adopted for use in the Army would be suitable for service in France as its performance was about equal to that of the planes used for similar purposes by the combatant Air Services abroad. However, after going thoroughly into the subject, the experts were convinced that the only solution to the problem was to greatly increase the power, thereby furnishing an engine that would not become obsolete within the next few years. This decision was reached after the plans for a rapid production type of 200 horsepower engines were advanced to such an extent that the working drawings had been finished. These plans were revised and the 400 horsepower Liberty was designed and production started by the end of the year 1917. It was fortunate for us that there was a plane existing at that time which might be said to have been under-powered when equipped with its original engines. Thus it was that we were able to put a 400 horsepower Liberty in the DH and secure about the maximum performance from it.

Maximum Performance Reached

It is to be noted here that the plane in use in the Army Air Service before the advent of the Liberty had approximately reached its maximum performance regardless of power. In order to service test the Liberty, several of these old planes were equipped with it and, strange as it may seem, by doubling the horsepower an increase in speed of only about 13 miles per hour was obtained.

During the World War the Liberty engine was the only successful high powered engine built in this country. When the World War ended, there were thousands of these engines on hand and it was but

natural that they should be used up before new types were considered for service. Accordingly, while higher powered engines were experimentally produced, the Liberty remained the standard high powered engine until 1922. Even in 1922, it was extremely doubtful whether the increase in performance obtained from existing type of planes by increasing the power was of sufficient value to justify the scrapping of all of the Liberties on hand. However, the problem was simplified with the advent of some new type wing sections which



Here are two extremes in airplane engine design. Above is an experimental 700 hp. W type engine developed at the Air Service Experimental Station at McCook Field. It has not been adopted for use in service planes. Below is the Wright engine used on Wright planes from 1908 to 1912. This engine was changed only in making improvements which increased the horsepower from 18 to 30; the general type remained the same. The gasoline pump and tube which leads to the nozzle in the intake manifold are plainly seen.

gave better performance for planes than did the existing types. This was particularly noticeable in the weight carrying abilities of the new type wing sections. Higher powered engines were used in racing planes and their use was instrumental in raising the world's speed record to 278 miles per hour. As a type, the Liberty has remained standard almost to the present time.

A 525 horsepower engine has been produced which is being successfully used in weight carrying planes and there is no doubt but that it will be the standard engine in single engined planes for that work for some time in the future.

The curve of horsepower plotted against years is very interesting. From 1903 to 1914, the curve is very regular, rising slowly, but in 1916 a large increase in horsepower was forced by necessity of circumstances in order that the Expeditionary Forces in Mexico should be properly equipped. Normally, the curve would be sluffed off from that date but the World War, a year later, forced the Liberty engine so that from 1914 to the latter part of 1916 that same rapid rise in horsepower continues and once again the curve becomes regular. After the World War, due to the enormous number of Liberty engines on hand, no attempt was made to standardize in the service a higher powered engine but, after several years had passed, and in spite of the fact that there were still hundreds of Liberty engines on hand, the necessity for a higher powered engine became apparent and in 1922 we see another rise in the curve which is almost normal with the regular rise from 1903 to 1914.

The higher powered engines developed in 1916 and 1917 were forced by War conditions. The same increase of power under normal conditions would not have been developed until at least two years later in each case. Naturally this ahead of its time development was only made possible with almost unlimited war funds. The after the war latent period of development brings the curve to practically the same point in 1925 where it would normally have come.

The Commercial Influence

The prediction as to the continuation of the curve beyond 1925 is complicated by many conditions such as efficiency of performance, amount of gasoline and oil that must be carried, reduction gears, size of propellers, advantages that the multi-engined plane has over the single engined plane, and the future demand that will be made for engines by the Government and by civilian corporations which seem now for the first time to be taking commercial aviation seriously.

The United States Government has been directly responsible for the rapid increases in power of airplane engines in the past but it is highly probable that from now on commercial corporations will dictate, as a result of their needs, the engines that will be produced in quantities.

Designs Completed for "R-101"

DESIGNS are being completed and construction will be started shortly on the new giant British dirigible to be called the R-101. The new ship is to have a gas capacity of 5,000,000 cubic feet, and will be equipped with two berth cabins to accommodate 100 passengers. Separate living and smoking quarters will be provided, the intentions in designing accommodations being to provide the maximum of comfort obtainable, as the ship is to be used for long commercial flights.

The gross lift of the ship will be 155 tons, of which about 75 tons will be available for fuel, water ballast, goods and passengers, the remaining 80 tons representing the weight of the ship itself. On a commercial run of 2500 miles about 20 tons should be available for passengers and goods.

The first engines for the ship are now under construction by William Beardmore & Co., Ltd. They follow conventional design throughout, but will burn a heavy gas-oil fuel, which greatly minimizes the risk of fire and reduces the cost of running considerably. The ship is to be equipped with seven of these engines, its estimated speed with all seven engines in operation being about 70 miles per hour.

The largest British dirigible at the present time is the R-36, which was launched in 1921.

Experiments are being carried on in the R-36, which has been fitted with a number of new instruments and devices for ascertaining the stresses and strains at various parts of the structure before finally beginning construction on the R-101.

Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

Canadian Production

A STATEMENT which has been prepared by the Dominion Bureau of Statistics at Ottawa, and circulated by the High Commissioner for Canada in London, shows that in 1924 the 11 automobile factories in the Dominion produced a total of 132,460 motor vehicles, of which 18,043 were commercial vehicles, the aggregate selling value being 88,240,418 dollars. The total production figure shows a decrease of 10 per cent over that for the year 1923, but in spite of this fact the average number of wage-earners in the industry in 1924 was slightly higher, at 7867, than in the previous year. During the period covered by the statistics Canada imported 957 commercial vehicles and exported 12,772 machines of the same type.

Sales Show Gain in Seville

PROSPECTS in Seville Province of Spain for 1925 are encouraging, and it is believed that this year's sales will exceed those of last year. Registrations of new automobiles during the first five months of the year show an increase of 35 per cent over those registered during the same period of last year. New cars registered during the period, January 1-May 31, totaled 590, of which 69 per cent were American. Last year's registrations reached a record total of 1076 cars of all makes.

Ford Agents in Russia

REPORTS by way of Berlin say that the Russian Soviet Government has made a proposition to the Ford motor commission now in Russia respecting the erection of airplane factories in the Ural district. The transaction is said to hinge on a concession to Henry Ford to erect motor car factories in Russia and the commission is expected to go to Detroit soon for instructions.

Scottish Motor Show

THE twenty-fourth annual Scottish Motor Exhibition will be held this year in the industrial Hall, Edinburgh, from November 13 to 21. The exhibits will be divided into two classes, first, private cars, and second, components and accessories. There will be no commercial vehicle section this year. The Scottish Motor Exhibitions since 1914 have been held in Glasgow.

Austria's Values Too High

AUSTRIAN customs authorities, in accordance with the custom law, have formulated tables of values for all foreign cars, basing these values principally on the comparative figure of a similar car of local production. This comparison has resulted in an arbitrary valuation upon American cars which is far higher than the American invoice value. From a review of the valuation prices which have been fixed upon American cars it would appear as though there was evidence of discrimination and this matter is now receiving the attention of the interested officials who hope to correct this condition very shortly.

Portugal Degree Favors U. S.

THE privilege extended to France under the commercial agreement between France and Portugal, effective March 15 to December 1, 1925, by which France is permitted to import into Portugal contingents of 100 chassis and 250 complete automobile, weighing more than 1500 kilos each, is to be extended to the United States, according to a cable from Chargé d'Affaires J. Webb Benton at Lisbon. Accordingly, an equal contingent of American automobiles will be permitted importation into Portugal. By a Royal Order of September 30, 1924, automobiles weighing more than 1500 kilos and chassis weighing more than 1000 kilos were prohibited.

Rubber Boom in Brazil

NORTHERN Brazil is enjoying a high tide of prosperity due to the high prices for rubber with rubber forest estates that have been given up in past years being reopened. In Para and the Amazon Basin, where wild rubber was once wrung from the forests or prepared for export, but where the entire trade has since fallen off from plantation competition there is now life and activity unthought of for many years. While Brazilian shipments of rubber are increasing rapidly, stocks at the ports are almost non-existent, having been shipped out in the first flush of demand.

U. S. Benefits by New Treaty

A COMMERCIAL convention was signed between Hungary and Italy on July 20, 1925, which guarantees mutual most-favored-nation treatment and also granted certain tariff reductions to each party on imports into the other's territory. Italy obtains from Hungary advantageous duties on automobiles. The United States is entitled to share equally in all concessions of duty granted by each of these countries to any other country.

Uruguay May Raise Duties

THE Uruguayan Chamber of Deputies has approved a bill establishing an additional duty of 10 per cent on automobiles of a valuation less than 1,500 pesos, of 15 per cent on automobiles of a valuation between 1,500 and 3,000 pesos, and of 20 per cent on automobiles of a valuation greater than 3,000 pesos. Trucks are exempted from these surcharges. The Senate is now considering this bill.

THE FORUM

Time Sales Situation Brings More Comments from Bankers and Finance Men

Editor, AUTOMOTIVE INDUSTRIES:

Ultimately, of course, only safe practices can prevail in this or any other business. And it is inevitable that more or less damage will be done before the thing can be worked out. Our greatest difficulty, perhaps, is found in two things: first, practices that are safe this year may be out of the question next year; second, credit extension is largely an individual matter and difficult to control by legislation. The Ford plan which is discussed at some length is, of course, not a collateral loan but purely a credit loan. We are unable to believe that it can receive sufficient banking support to bring about any general application of it. The business of making collateral loans, which method most of us follow, will gradually become stabilized. Frank expressions, such as yours, will go far to bring about this stabilization.

RICHARD D. EWING,
President, Motor Finance Corporation.

Editor, AUTOMOTIVE INDUSTRIES:

Though we have not kept in as close touch with this type of paper as some banks, yet it is our impression that you have in your article stated the situation correctly. There is no doubt in my mind that finance companies handling this type of paper are in a very unstable condition and will sustain very heavy losses whenever a period of depression or severe contraction of the money market develops. It is our belief that only when the finance companies conform pretty uniformly to the principles set forth by the National Association of Finance Companies will the present unsafe condition be remedied.

JAY KNOX,
Interstate Trust & Banking Company.

Editor, AUTOMOTIVE INDUSTRIES:

Undoubtedly the present competitive situation among the finance companies in the automobile industry and in financial circles have given rise to abuses of the financing methods. The tremendous importance of the automobile industry places our whole economic welfare subject to its sound financing and constitutes this problem significant not only to large interests concerned directly or remotely with motor production and distribution but to the entire business world. A decade has seen the "Time Sales" plan develop from an expediency to establishment without one severe test. But a test is inevitable unless the educational programs you advocate are diligently enacted.

DAVID D. DILLMAN,
Union Trust Company,
Chicago, Ill.

SINCE the publication of the article, "Concern Felt Over Growing Liberality of 'Time Sale' Terms," in *Automotive Industries* of July 2, scores of letters commenting on the situation have been received from finance companies, bankers and automobile executives. A large number of such letters were digested and used as the basis of a second article on the subject in the July 30 issue.

Other letters have been received since then, and inasmuch as they help to round out what has proved a highly interesting and useful symposium, and tend further to clarify the various issues of the problem, we present some of them here.

Editor, AUTOMOTIVE INDUSTRIES:

To properly analyze lurking dangers in the installment sales of automobiles you should have another article hooking up automobile time purchases with purchase money obligations for radio equipment, vacuum sweepers, pianos, Oriental rugs, paint and the dozens of other things which can now be financed on installments. The most outstanding truth in your article is the statement that the banks are very much to blame for the prevailing conditions. Competition is undoubtedly beneficial to business, yet when conditions have reached the point where the principal thought is to increase volume in order to take care of overhead, poor credit risks are bound to appear and therein lies the danger.

O. F. MEREDITH,
Asst. Cashier, The Bank of America.

Editor, AUTOMOTIVE INDUSTRIES:

We think automobile financing very much the same as any other line of business where goods are sold on credit. We do not understand why so much anxiety on the subject of automobile financing. A manufacturer, wholesale dealer or retail dealer of any kind must do a big credit business if he is successful. Why is not the automobile financing safer than any other credit line, when you take into consideration that we always have security on our money that is outstanding? We advance only 60 to 60 per cent on standard make automobiles and take a conditional sales contract on the car to secure the unpaid balance. Think of the wholesale millinery house that sells to women milliners all over the country in small towns and villages, where their rating is very low and their business ability is very limited. Think of the big wholesale groceries selling to all kinds of credit risks, giving them credit without any security whatever. There are a great many of these storekeepers who do not have the executive ability to conduct the business. Does it not occur to you that our kind of business, properly managed, is safer than any of the big concerns in the merchandise line, yet there is never any question about their business being unusual in character. The finance business is rather new, and in

some cases is not under the management of well seasoned executives, but this is not generally true. If banks, trust companies, insurance companies, manufacturers and merchants in general do not exercise great care, they are all subject to losses, and if the above concerns or finance companies do become too liberal and suffer losses, it is certainly chargeable to bad judgment or mismanagement.

OWEN J. CONRAD,
President, Continental Finance & Securities Co.

Editor, AUTOMOTIVE INDUSTRIES:

The conditions existing at present in the automobile finance business are very well described in your article and I feel quite sure will help materially to bring to the attention of those interested some of the things which should be done to put the business on a higher plane. It might take some time for all finance companies to realize, as Mr. Duncan expressed it, that "they must sink or swim together." However, if the educational work which has been started among the more stable finance companies and banks and some other sources is continued, I believe that in the not too distant future all companies will generally agree upon a definite program for the good of all concerned.

L. J. MORET, Vice-Pres. and Manager,
Standard Motors Finance Co., Inc.

Editor, AUTOMOTIVE INDUSTRIES:

Unless a precedent is established to at least a substantial down payment, it seems to me that the credit risk on automobiles should be carefully looked up. Further, on the extended terms of over twelve months there is too much of an element of conditions beyond our control to foresee what is going to happen to the industry in that time, as well as general business, to warrant such extended terms. The reason the automobile business has grown to such an enormous height is that in its origin it was an absolute cash proposition and no one was willing to assume the risk, and from present indications I would not consider it a healthy condition to see the extreme terms that are offered by various finance companies, for the inevitable result is bound to come.

W. H. BRAMMAN,
Secretary, Remedial System of Loaning, Inc.

Editor, AUTOMOTIVE INDUSTRIES:

We have made an investigation of this particular field of finance for statistical purposes, and from our records in this department we find that your article verifies, for the most part, the conclusion which we arrived at in our investigation. The most important safeguards for this type of paper seem to be a limitation on the minimum amount of down payment and the care taken in investigating the financial responsibilities of the purchaser. The practice of small down payments with maturities of over twelve months seems to be economically unsound. Finance companies find it necessary in some cases to permit these terms, but we believe that it should be discouraged in every way possible. A limited amount of long term paper, or small down payment paper, is not objectionable if the company limits it to a low percentage of its total volume of business.

W. C. ENGMAN,
Service Department, William R. Compton Co.

Editor, AUTOMOTIVE INDUSTRIES:

At one time, we felt that the used car situation was the big thing that the automobile dealers had to contend with, but since the finance companies have, in the greater part, expressed a desire for and have solicited automobile paper on twelve to eighteen months' time without recourse and in the greater part with small down payments, we have about come to the conclusion that this situation is more of a menace to the dealers than the old used car problem was. The present plan of selling automobiles on eighteen months' time, without recourse, may increase sales for a while and the dealers may feel no ill effects, but some day there is going to be a reckoning. One or two things, or possibly both, are almost sure to happen, and there is no question but there will be a wholesale list of repossessions by the finance companies who have purchased contracts without recourse, which no doubt will be hastily thrown on the market, which will literally demoralize the used car market and the finance companies will withdraw from the field. This, in all probability, will not happen until the local finance companies have liquidated and gone out of business. This leaves the dealers confronting two situations, a demoralized car market and no place to finance their paper, even in the event they continued selling on the installment payment plan. What the solution of the problem is, and where it is going to end, is hard to say.

J. L. CAMPBELL,
Secretary, Spokane & Eastern Trust Co.

The Centenary of Benzol

IT is just one hundred years ago that benzene, the chief component of benzol, a motor fuel much used in various European countries, was first discovered. The discoverer was none other than Michael Faraday, the great English phycisist. Having been appointed assistant in the laboratory of the Royal Institution, he worked on a variety of chemical subjects for a number of years and on June 16, 1825, laid before the Society the results of his study of the liquid extracted from compressed oil gas, in the course of which he had discovered the compound of carbon and hydrogen now known as benzene.

Speaking on the subject "Faraday as a Chemist" at the Royal Institution recently, Sir William Pope said: "The hydrocarbon benzene, which is now separated in large quantities from coal tar, is the parent substance from which all the synthetic or coal tar dyes are derived. At this centenary of the discovery of benzene we celebrate the anniversary of the initiation of a large branch of organic chemistry, which in later years became of great scientific importance, and which, in addition, became the foundation of the several vast industries dependent on the utilization of the components of coal tar. Among these latter are to be numbered not only the manufacture of coal-tar dyes, but also important sections of the pharmaceutical, photographic and petroleum industries."

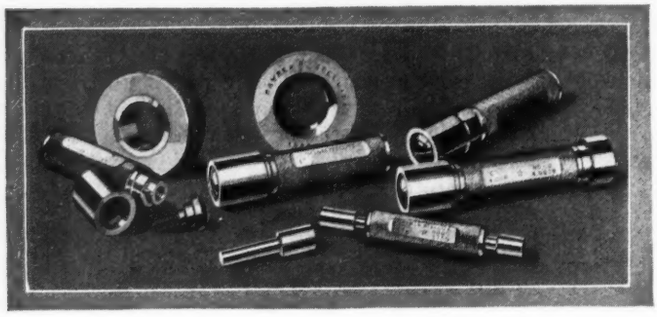
Volume 52 Index Now Ready

THE index for Volume 52 of *Automotive Industries*, including issues from January 1 to June 25, 1925, is now ready for distribution. A copy will be furnished gratis to subscribers who request it. Those who have received previous indexes will be supplied with a copy of this one automatically and need not make a special request for it.

New Developments and Ideas

Haynes Stellite Gages

AN addition has been made to the line of small tools manufactured by the Haynes Stellite Company, 30 East 42nd Street, New York, in the form of a complete set of plug and ring gages for manufacturing purposes. The plug gages are made in sizes ranging from ⅛ in. to 3 in. in diameter. The body of the gage is made of an aluminum alloy in order to reduce its weight to a minimum. Sizes smaller than ½ in., have removable



Plug and ring gages of Stellite, made by the Haynes Stellite Co.

gaging tips that are driven in the body by a taper fit. Larger sizes are made so that the gaging portion is of ring form, held in place by a cap screw. The body is knurled to give a good grip while the gage is being used.

The ring gages, made in sizes from ⅛ in. to 3 in. in diameter, have an aluminum body cast integral and held securely by a grooved tongue on the Stellite portion. Both types of gages are made to standard tolerances and are finished to 0.0001 in.

A test conducted by the Bureau of Standards showed the life of the Stellite gages to be four to six times greater than that of steel gages used under corresponding conditions. As Stellite is a non-magnetic metal, composed chiefly of cobalt, chromium and tungsten, metallic chips will not cling to its surface, thereby insuring a more accurate measurement.

Standardizes Shafting and Key

TWO important dimensional standards dealing with cold-finished shafting and square and flat shafting keys, recently approved as "Tentative American Standards" by the American Engineering Standards Committee, have just been published by the American Society of Mechanical Engineers, the sponsor, and are ready for distribution.

The sizes covered are from ½ to 6 in. (machinery shafting) and 15/16 to 5 15/16 in. (transmission shafting.) The recommended stock lengths for cold-finished shafting are 16, 20 and 24 ft. All the tolerances are negative and represent the maximum allowable variation below the exact nominal size.

The keys considered for these sixty standard shaft-diameters are either square or flat. The standard widths and heights and the corresponding negative tolerances are given. The keys are to be cut from cold-finished stock and are to be used without machining.

The sectional committee is now working on formulas to guide engineers in the selection of the best size of transmission shafting for use under various conditions of loading. The chairman of the committee is Lloyd M. Chapman and the secretary is C. B. LePage.

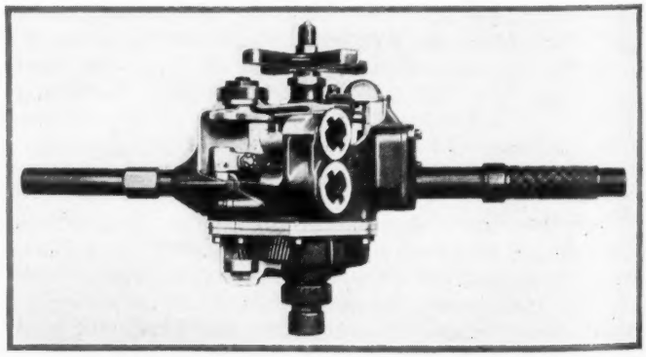
The standards for shafting and keys known as B 17a and B 17b respectively are the first dimensional standards having national approval to be published in this country in the single sheet form. They may be secured from the American Engineering Standards Committee, 29 West Thirty-ninth Street, New York City, at 20c. per sheet.

Aluminum Casting Process

PERMANENT mold castings of aluminum are manufactured by a new process by the Permold Company of Cleveland, Ohio. As regards speed of production this process is said to range midway between the sand casting and the pressure die casting processes, but the product is said to have a distinct field not covered by either. The castings are claimed to be free from porosity and blow holes, so that they will not permit leakage of liquids and gases under pressure. The castings are also claimed to be free from black spots and pin holes and to have a smooth surface. The castings are accurate in dimensions, which always assures that they will fit the machining jigs and fixtures and often eliminates the need for machining. While the process has certain limitations, castings as light as one ounce and as heavy as 17 lb. have been made.

New 4-Cylinder Pneumatic Drill

A NEW line of four cylinder pneumatic drills, including both reversible and non-reversible types, has been placed on the market by the Ingersoll-Rand Co. These drills are fitted with speed governors which automatically prevent racing of the drills beyond a safe working speed.



Ingersoll-Rand four-cylinder, reversible, long-stroke, pneumatic drill, shown partly in section so as to expose the helical gearing, piston, cylinder liners and crankshaft

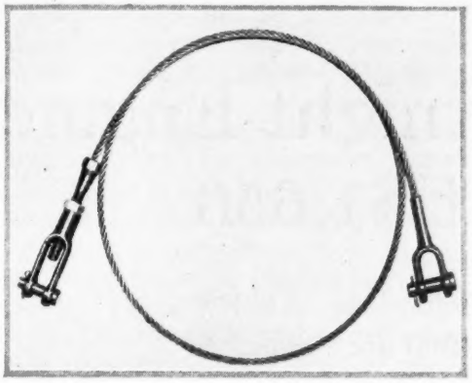
The governor saves on air consumption and prevents unnecessary wear and tear on the drill parts. In tapping and reaming it prevents burning of taps and reamers.

In the Automotive Field

New Cable and Fittings for Brakes

A NEW type of wire rope known as Tru-lay and a new type of fitting for wire rope connections, known as Tru-loc, have been developed by the American Cable Co. of New York and are believed to hold out the possibility of much wider use of steel cables for brake connections.

Tru-lay cable or rope represents a new departure in wire rope making. Each wire and strand is pre-formed to the exact shape it must assume in the finished rope, with the result that there is no tendency to unstrand. This is said to insure greater stability; that is, better retention of both length and diameter. In the larger sizes the rope is already in extensive use for general industrial purposes.



Tru-lay brake cable, with Tru-loc fitting

The new Tru-loc fittings are mechanically applied. The fitting, in the form of a steel sleeve, is slipped over the unseized end of the rope, and by a mechanical compression process the metal of the fitting is then flowed down upon the rope. The cable is supplied in correct lengths ready to install, with the fittings properly designed for the application in question.

These new fittings do away with the necessity of fitting, splicing and clamping, and therefore represent quite an advantage over the older applications of steel cable to brake connections. As compared with brake rods, the chief advantages of cable are that it does not rattle and that it is not subject to fatigue, at least not to anything like the extent of rods.

New Light-Weight Bus Body

A NEW bus body, known as the Tour-A-Bus, has been announced by the Weatherproof Body Corp., Corunna, Mich. The principal advantage of the new design, according to the builder, is that it weighs only about one hundred pounds per passenger, the weights and seating capacities (including driver) of the different sizes being as follows: 16 passenger, 1600 lb.; 20 passenger, 2000 lb.; 24 passenger, 2400 lb.

The saving in weight is due principally to two items. The doors are only half-height, since the extra heavy pyralin windows which are hidden in the deck are so designed that they slide down between the top of the door. Such construction is claimed to give not only greater window opening, but to save nearly three-fourths of the weight of the full door and glass window construction.

The second item on which weight is saved is the construction of the frame and sills. Only hardwood of the best grade is used. The size of the posts and the other members is held down to a minimum. Adequate strength is secured by the special placing of braces, and all points are mortised, screwed, bolted and glued.

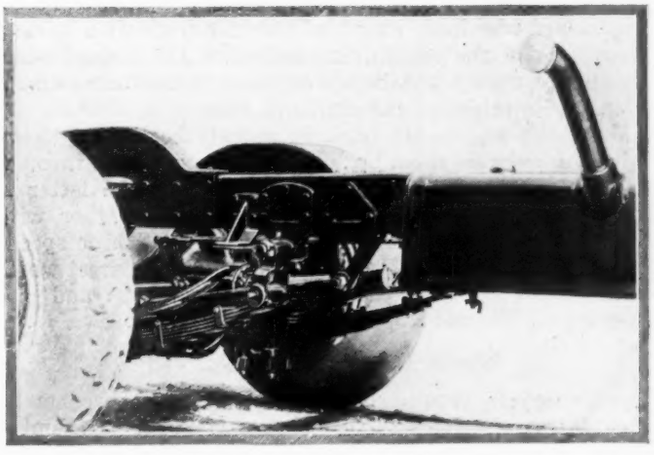
Selden "Roadmaster" Bus

A new bus chassis designated as the "Roadmaster," designed for a street car type bus body seating 21 passengers, and listing at $3,375, f.o.b. Rochester, has been developed by Selden Truck Corp. It is powered by a six cylinder 72 hp. Continental motor and has a speed of from 5 to 50 miles per hour in high speed.

The motor has 3¾ in. bore, 5 in. stroke, removable head, 4-bearing crankshaft, three point suspension, and pressure lubrication. North East battery type ignition, Brown Lipe multiple disk dry plate clutch and Brown Lipe transmission, Stromberg carbureter, Clark bevel drive rear axle and cellular type radiator are used.

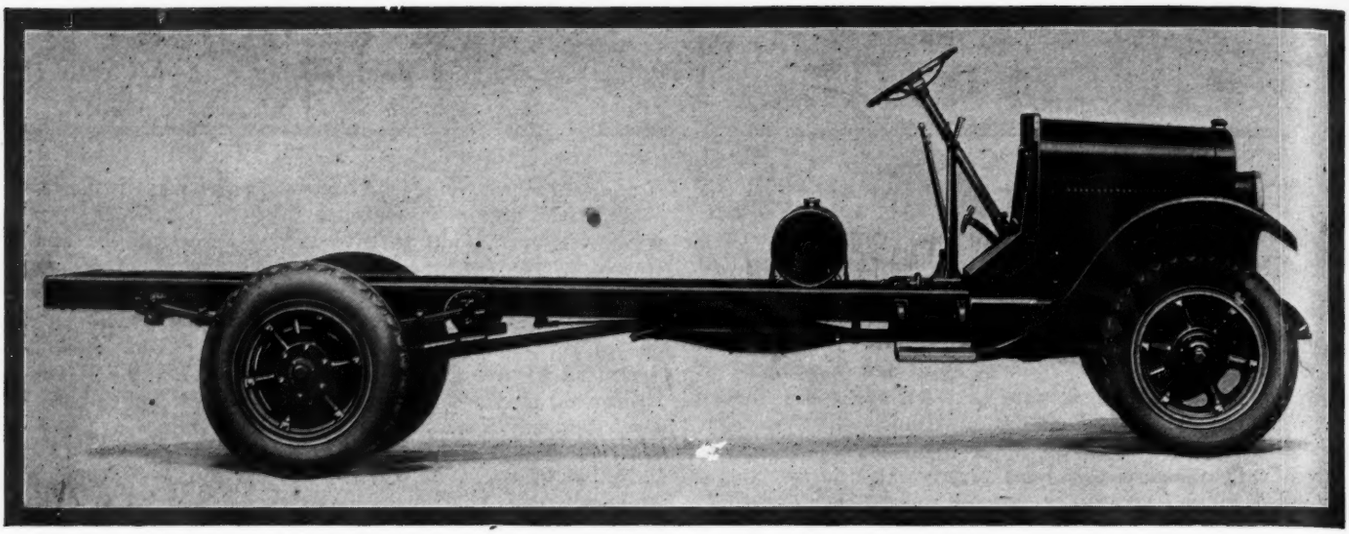
Frame is pressed steel 5¾ in. by 3½ in. by ¼ in. with kick-up over rear axle. Rear springs are three-stage semi-elliptic to provide easy riding conditions under all loading conditions. Steering gear is Ross cam and lever, wheels are Van artillery type with disk optional at additional cost, front tires are 32 by 6 in. and rear 36 by 8 in., all pneumatic. Tread is 56 in. both front and rear.

Service and emergency brakes are internal expanding on rear wheels. Front axle is drop forged alloy steel I-beam. Wheelbase is 177 in. Frame height is 26 in. at entrance door back of cowl. Chassis weight is 5200 lb.



Close-up of rear, showing three-stage spring suspension

Controls are standard. Equipment includes horn, ammeter, speedometer, Motometer, front bumper, spare rim, Alemite grease gun, and oil pressure gage.



Federal Adds 2-Ton Knight-Engined Truck Priced at $1,650

Bore and stroke of powerplant is 3⅝ by 4½. Vehicle is capable of handling loads up to 4000 lb. Standard wheelbase 144 in. Chassis weighs 3000 lb.

THE Federal Motor Truck Co. has just produced a new two-ton Federal-Knight listing at $1,650.

Besides incorporating the sleeve-valve engine and other modern features such as a full floating rear axle and full pneumatic tire equipment not found in the former one and a half to two ton trucks manufactured by this company, the new model is capable of handling loads up to 4000 lb. in excess of body weight at a constant high road speed. A standard wheelbase length of 144 inches allows a loading space back of the seating amounting to 119 inches, while for special work a 156 inch wheelbase chassis can be supplied. The weight of the standard chassis is 3000 lb.

From the 3⅝ by 4½ in. bore and stroke Knight sleeve valve engine of 21 rated hp., drive to the gearset is through a 10 in. single plate Borg & Beck clutch. The latter is completely inclosed in a bell housing and together with the transmission forms a unit power plant. Three speeds forward are provided in the selective, sliding gearset which employs annular type ball bearings throughout and also spur type gears and a splined main shaft.

Worm Drive Axle if Desired

A two piece tubular propeller shaft with three metal type universals connects the powerplant with the Timkin heavy duty, full floating, bevel gear rear axle providing a standard gear ratio of 6 3/7 to 1. The differential is carried on heavy tapered roller bearings inside the pressed steel housing which is fitted with two axle bearing mountings on either side. In line with the policy of the Federal Truck Company, this model also can be supplied with a worm drive rear axle if desired.

The front axle is of drop forged I-beam alloy steel and allows a ground clearance of 11 in. at its lowest point. A standard tread of 56 in. is provided for on the front axle while at the rear the tread is 57 in. with a road clearance of 9½ in.

Both service and emergency brakes which operate on the rear wheels are of the internal expanding type and operate on 16 in. diameter drums having a face 2¼ in. wide. On to a pressed steel channel frame of a greater depth than 5 in. are secured the frame brackets and the five cross members which are hot riveted, while the semi-elliptic springs are attached by shackle bolts in the conventional method. The dimensions of the front spring are 38 by 2¼ in. while those on the rear are 52 by 2½ in.

Turning Radius of 26 Feet

Providing a turning radius of 26 feet, the steering gear is of the irreversible worm and wheel type and is operated by an 18 in. hand wheel. Both spark and throttle controls are mounted on the steering post while the horn button is located in the center of wheel.

Mounted on six spoke cast steel wheels with demountable rims, standard tire equipment includes 30 by 5 in. pneumatic cords on the front with 32 by 6 in. tires on the rear. For a slight additional charge oversize tires are also available, while, for those who so desire, solid tires can be had if a worm type of drive is ordered.

Fuel is fed to the thermo-syphon cooled engine by a vacuum tank from a 15 gallon cylindrical tank mounted on the chassis frame under the seat position. Standard equipment includes hood, front fenders and step, dash and toe boards, Alemite chassis and lubrication system, oil pressure gage, speedometer and tools. Included in the electrical system are generator, starter with Bendix drive, motor driven horn, head and tail lamps, ammeter, and heavy truck type 18 plate battery. The Federal people have the new model in regular production.